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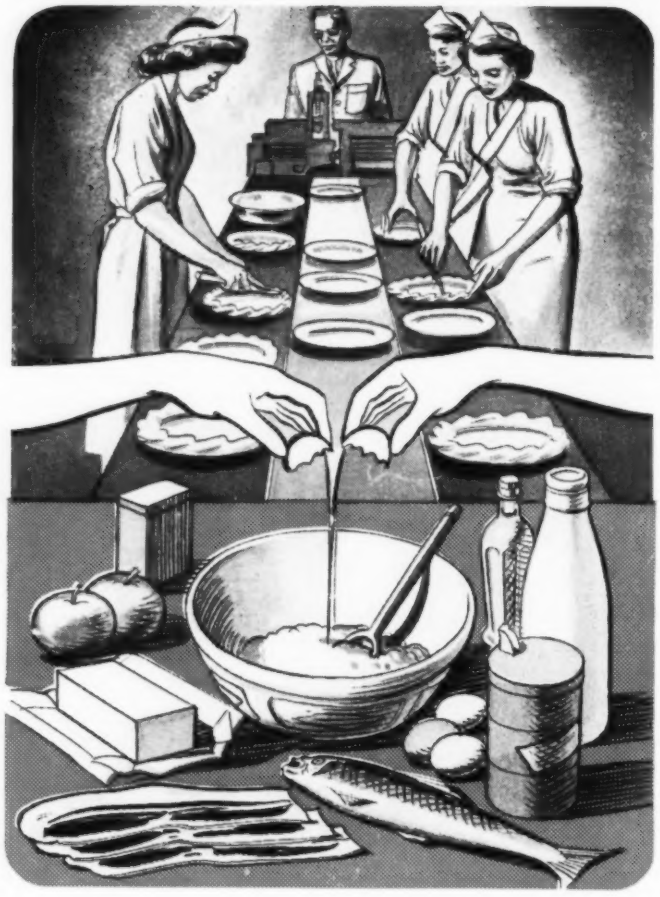

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FOOD MANUFACTURE

Vol. XXVI. No. 5 · Published Monthly · May 1, 1951

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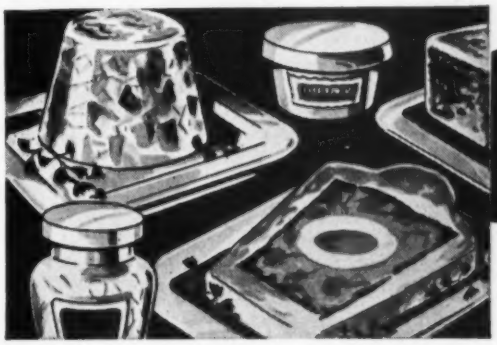
Published by Leonard Hill Limited, 17, Stratford Place, London, W.1. Mayfair 7383.

***Subscription Rates:** 1 year $5; 3 years $10; paid in advance*



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FOOD MANUFACTURE

Vol. XXVI, No. 5 May 1, 1951

The Agene Problem

IN the course of his evidence at the triple tragedy inquest on a man who had murdered his wife and child and then hanged himself, Dr. J. J. Coghlan, of Hull, propounded some sensational theories, which received considerable publicity in the daily Press, on the effects on human beings of bread made from agene-treated flour. The doctor declared that the majority of people in Great Britain were suffering from its effects, and that agene, since 1940, had killed 250,000 people. According to the published reports he attributed the physical and mental state of the murderer at the time of his crime to agene poisoning.

The doctor, whose contentions were strongly disputed by Mr. T. H. Jackson, a Hull solicitor who appeared for the Ministry of Food, and by Dr. H. E. McGee, Senior Medical Officer (Nutrition) of the Ministry of Health, was unable to quote any reference in the medical literature regarding ill effects of agenised flour on man.

When the Coroner asked Dr. McGee why the Americans had stopped the agenising of flour, the answer was: "It is difficult to say."

In January 1950, an announcement was made by the Ministries of Food and Health, which stated that "in view of its deleterious effect on certain animals, the Committee (which was made up of representatives of the Ministries of Food and Health, the Medical Research Council, and the milling industry) has felt that the use of agene should be discontinued," a recommendation which has not been put into effect.

The *Daily Mail* quotes a Ministry spokesman as saying: "There has been at no time any reason why a decision on agene-treated flour should be made in haste. We have been waiting on the work of British chemists so that millers would not need to change to an American system which would cost hundreds of thousands of dollars. Although we decided against agenised flour, there has never been any reason to fear its effect on the public. Agene will remain in use until chemists have found a substitute."

The Americans, on the other hand, have arrived at a definite conclusion: unless it could be proved correct beyond any shadow of doubt that agene had no harmful effects upon human beings, it should be regarded as a hazard and therefore not used.

Which is the right attitude must be a matter for the opinion of the experts. In the meantime, to the timid, it might be suggested that they eat brown bread. But even then they will be confronted by the phytic acid bogy. The way of nutrition is hard!

U.S. Food Packaging Methods

At the Packaging Conference which was held during the Second National Packaging Exhibition, two American experts delivered short but interesting and stimulating papers on U.S. methods.

Mr. Robert de S. Couch of the General Foods Corporation, U.S.A., sketched the sequence of operations carried out during the development of a package for a new product. Having decided upon the main characteristics of the package, the problem is discussed with the company's suppliers to obtain any knowledge they have on the method of packaging the type of product visualised. If the product is similar to any already on the market, the package used by the competitors is evaluated, and the materials and machinery used to produce this package are often discussed with the competitors. With this information available, the company then try to confine their selection of materials to standard size packages produced on standard machines whenever possible.

He mentioned the interesting fact that among American manufacturers there is no hesitancy in showing competitors their packaging systems for the main reason that what is selling is the product. By such collaboration it is possible to obtain materials and machinery at a lower cost and a higher rate of production.

The next step is to produce experimental packages and evaluate them in the laboratory. If the packages appear to be successful, progress made is discussed with the management and a decision is arrived at to continue with a plant trial. If this also meets with success, steps are then taken to produce a fairly large volume for sale in the field.

Turning to the subject of machines, Mr. Couch mentioned that he had seen some in the Exhibition which looked as though they could be sold in America. When sales were made, steps should be taken to have personnel on the spot who are acquainted with the machine to help the Americans when it is first used, as there is always a breaking-

in period of from one to three months before it is functioning efficiently. Moreover, replacement parts should be provided.

Dr. Laurence V. Burton, describing the work of the Packaging Institute of U.S.A., of which he is Executive Director, said that a survey of thirty-five companies, making over a hundred products, showed that packaging occupies four times as many labour-hours as the preparation of the products to be packaged. In other words, packaging is a principal business in the U.S.A., so far as the consumer goods industry is concerned.

In Dr. Burton's opinion, a new approach to packaging is necessary and more attention should be paid to it by management; he would like to see compulsory co-ordination and control.

With Mr. Couch, he stressed the need for consultation with competitors, as such co-operation led to the exchange of information which was of advantage to all people concerned. Dr. Burton quoted the case of penicillin which was difficult to pack because of its peculiarities: the package had to be moisture-tight and at the same time easily opened. The solution of this problem was shared by two competitor companies, whose investigations were pooled. The same amount of money was spent as would have been done if one company had worked alone, and the result was that two excellent packaging lines were developed. Eight other competitor companies were allowed to share the information, the reason being that if the package developed by one or more of these companies had been a bad type of pack, the *product* would have been blamed, and therefore all packers of penicillin would have suffered.

Dr. Burton's remarks may point a moral for packagers in other countries.

Analytical Chemistry in the Midlands

That chemistry is a dynamic and inspiring science is shown not only by the expanding activities of its established societies and institutions but also by the occasional formation of new groups of chemists drawn together by common professional interests or because they happened to be neighbours. A recent example of this latter trend has been the establishment of a Midlands Analytical Methods Discussion Group, centred on Birmingham, as the result of a feeling among Midland chemists of the need for an organisation of their own capable of catering for their numerous day-to-day problems in the wide field of industrial analytical chemistry. The Group is independent of existing organisations and is designed to appeal especially to younger people under twenty-one, who can benefit from the guidance of their seniors. Accordingly the annual subscription is fixed at 5s.

The Group's main activity is the holding of eight monthly meetings each year throughout winter and spring on various aspects of analytical chemistry—biological, physical, mathematical, organic, or inorganic—the actual subjects being chosen by popular agreement. The meetings are not lectures in the accepted sense. The method employed is to invite experts to speak on their subject for about fifteen minutes, after which the meeting is open for original contributions, questions, and a general discussion. This novel procedure has proved very successful, and the eagerness of members to take part in the discussions is a heartening feature.

The Group has now completed more than half its 1950-51 programme, and among the subjects discussed have been: The Alkali Metals; Physical Methods of Food Analysis; Estimation of Zinc; Determination of Carbon, Hydrogen, and Oxygen; The Analytical Chemistry of Phosphorus; Problems of Steel Analysis; The Analytical Chemistry of Boron; and Chromatography.

Under the chairmanship of Mr. J. R. Leech, President of the Birmingham section of the British Association of Chemists, the Group already has an enthusiastic membership of more than 120. Members come not only from Birmingham but also from several other big Midland towns.

We wish the new Group continued success.

Sulphur and Food Production

To be dependent on one source of supply for over 99 per cent. of sulphur requirements has been a weakness in our economy. American users themselves cannot get enough, and it is not unnatural that there should be considerable pressure in the United States for exports to be curtailed.

The American Gulf Coast deposits from which sulphur can be mined cheaply are being exhausted; it is estimated that they cannot last more than another twelve to fifteen years at the 1950 rate of mining, a rate likely to be further increased through rearmament.

The main use of sulphur is in the production of sulphuric acid, a vital intermediary in almost every branch of chemical industry. By far the biggest consumer of sulphuric acid is the fertiliser industry, mainly in producing superphosphate, but to some extent in making the by-product sulphate of ammonia, so that agriculture and the food industry will also feel the pinch.

It is possible to produce sulphuric acid from pyrites, spent oxide from gas-works, and anhydrite; of the last, there are large deposits. It will take time to convert acid plants to enable them to use pyrites instead of sulphur; the erection of additional plants to treat anhydrite will take longer. Acid from these sources will generally be dearer than acid made from sulphur, so that even if scarcity is even-

tually overcome, say in two or three years' time, fertilisers will tend to become dearer.

A smaller use of sulphur, for which there are as yet no satisfactory alternatives, is in the production of fungicides for fruit, *e.g.* lime sulphur and polysulphide sprays. Although the total tonnage involved must be small compared with that used for making sulphuric acid, any reduction in the supplies of sulphur-based fungicides will have deplorable effects upon the quality of apples and pears. Particular priority should be given to this branch of industry as sulphur alone can control the scab diseases of top fruit.

New Zealand and Australian apple growers, who have hitherto depended upon imported sulphur, will also be faced with severe reductions in supplies. The effect of sulphur scarcity upon fertiliser production can be overcome. The effect upon fungicide production seems much more deadly.

Scientific Research in 1949-50

The Department of Scientific and Industrial Research Report for 1949-50, published in March, devotes just over half its space to the work of the various research associations. There is abundant evidence that these joint ventures of State and industry are growing vigorously. Indeed, their size and number are now preventing the D.S.I.R. Council members from maintaining their pre-war practice of making periodic visits; instead, the Council has been obliged to appoint two individual "visitors" to maintain regular contacts with each association.

In the list of these research organisations the food industry is represented by the British Baking Industries Research Association, the British Food Manufacturing Industries Research Association, the British Gelatine and Glue Research Association, and the Research Association of British Flour-Millers. The last of these was taken over by the Ministry of Food during the period of control so that it must for the present be regarded as a State centre entirely. The total income of the first three associations for the period under review was £92,742, and as none of them was formed until after the war, this measure of support is highly satisfactory. It is one of the merits of the D.S.I.R. scheme that Government contributions will increase *pari passu* with the industrial contributions.

Among the many items reported is the addition of a new wing to the premises of the Baking Industries Association. This is expected to be ready shortly, and will house a pilot-scale bakery, an experimental bakery, and additional laboratories. The Food Manufacturing Industries Association has settled into its new premises at Leatherhead, and work has been started on rheological studies, or problems of shape deformation and flow of materials, a little investigated field, yet one of great significance for manufacturers of foods such as pastes, creams, and chocolate. The Gelatine and Glue Association has taken over the London premises formerly occupied by the Food Manufacturing Industries centre.

An important feature of this type of technological research is the provision of information, not only for members, but also for consumers of the commodities concerned, the public, and the technical Press. The Baking Industries Association, for example, has published over one thousand abstracts and a bi-monthly bulletin containing semi-technical articles, and the Food Manufacturing Industries centre is issuing details of analytical methods used in different sections of the industry.

Mention should also be made of the comparatively "elderly" Chipping Campden Research Station, supported both by the D.S.I.R. at the rate of £5,500 a year and by 160 subscribers providing £4,500 annually. Hitherto primarily concerned with canning research, the Station is now to foster additional research upon the quick freezing of fruit and vegetables.

Salvation through Science

All scientists, industrialists, and economists qualified to diagnose and comment on the present defects of British industry are unanimous in the opinion that it is vitally necessary to increase the numbers of scientifically trained men and women in industry, who must be rapidly absorbed by industry so that our past failures to exploit the results of our fundamental inventions may be rectified. The need for this course becomes increasingly urgent as the pattern of world trade changes, with the under-developed countries, who have been our best customers, beginning to make basic necessities themselves and now demanding new products of more complicated design and manufacture in exchange for the raw materials and other things we need from them. This is the unalterable trend of the times, and against this background it may seem that the proposition put forward is self-evident. This may be so, but there is a great gap between acceptance of a policy and its full implementation. To achieve the latter it is necessary to proclaim the policy repeatedly, and to marshal behind it the full weight of authoritative opinion.

It was, perhaps, with this in mind that Lord McGowan chose to make the case for more applied science in industry the burden of his survey entitled "1851-1951: A century of British industry," given at the Royal Society of Arts in January. Quoting the well-known case of Perkin's discovery of mauveine as an example of our chronic weakness of failing to exploit fundamental discoveries, he said that the practical application of scientific knowledge to industry must be made a matter of national policy.

American universities are producing more technologists than pure scientists, but in Great Britain, as recently as 1949, degrees in applied science represented only some 12 per cent. of the total.

This position must be radically altered. The old idea that a career in applied science in industry is inferior in status to other professions must be killed stone-dead if we are to meet the challenge of the times. If we accept an increase in overall national productivity of not less than 5 per cent. per annum as our objective, a similar rate of increase is required in the supply of graduates and others with the necessary applied scientific training. To do this our educational system must be reorganised, and technical colleges will have to be upgraded to share the burden with the universities.

These new men of industry, continued Lord McGowan, must be absorbed by managements as fast as the supply allows, so that others may be encouraged to follow them. The aim is to abandon our conservative attitude to productivity and acquire some of the Americans' fervent belief that the discovery of faster, cheaper ways of doing a job is everybody's business.

Food and Caries

The problem of caries in relation to food has had attention for more than half a century. Further experimental evidence supporting the concept that acid erosion is the fundamental cause of dental caries has been described in *The Journal of the American Medical Association*, **145**, 5, 321. From a microbiological point of view, the demonstration of the high acidophilus count in carious mouths was of great significance since it revealed a mechanism for the production of acid food residues. Another important observation was that in a group of children the only significant difference between the composition of the saliva of caries-free and of carious mouths was the strikingly higher buffer capacity of the former.

That contact of food with the tooth surface is a prerequisite for caries production seems clear from an investigation in which a caries-producing ration was fed to young rats through a stomach tube. While lesions developed in all rats in the control group eating the diet, those receiving the food through the tube were not affected.

"Soft" drinks, which usually contain a considerable concentration of organic acid in addition to flavouring, sugar, and carbon dioxide, and acid-sugar combinations that simulate "soft" drinks, produce etching of the enamel and dentine of the teeth of laboratory rats, hamsters, and dogs. Apparently the acid attack is a function of titratable acidity of the beverage rather than the *p*H, while the buffering action of the saliva serves to oppose the erosive action. Acid fruit juices have recently been implicated, and the citrate ion seems particularly prone to produce dental lesions.

The role of nutrition in the etiology of dental caries has received considerable attention, and vitamins and minerals have been regarded as factors specially involved in dental health. Although there are doubtless nutritional and metabolic factors favouring the development and integrity of the teeth, the presence of acidity, either preformed in food touching the surface of the teeth or developed by bacterial degradation of food residues in the crevices around the teeth, appears to be a prominent factor in the erosion of enamel and dentine.

Emergency Laws Continued

New Orders in Council which have been made through the power of Emergency Laws (Miscellaneous Provisions) Act, 1947, provide that various Defence Regulations which were due to expire on December 10, 1950, will continue to be in force until December 10, 1951; there is also an Order postponing the operation of an Act until that date.

The Defence Regulations still effective are numerous, and space forbids details, but it is important to note that the whole of the Defence (Sale of Food) Regulations, 1943, continue to operate. Of those Regulations which will expire on December 10, 1951, there is one concerning patents, trade marks, etc., under which power is given to certain Government Departments to obtain particulars of any inventions, designs, or processes from any person, if it is considered in the national interest to do so. Another Order in Council continues provisions in the Patents Act, 1949, which give power to a Government Department to make, use, exercise, or vend any invention for certain purposes, *e.g.* in the national interest; this allows dealing in patented foods and other goods.

The Order in Council postponing operation until December 10, 1951, relates to The Restoration of Pre-war Trade Practices Act, 1942. The term "trade practice" means any rule, practice, or custom regarding the class or classes of persons to be or not to be employed in the undertaking, or to the conditions of employment, hours of work, or working conditions.

Under the terms of this Act, an employer is obliged to restore any trade practice which was in operation before September 3, 1939, but which has since been departed from, within two months of a date which, for this purpose, was to be laid down as being the date of the end of the war. Various dates have been laid down by Orders in Council since the Act was passed, each subsequently being postponed. By the 1950 Order, the date is fixed at December 10, 1951, so that any war-time practice can be continued until then.

From Transport Depot to Deep Freeze Plant

Early in 1949, realising that the transport industry was to be nationalised, Mr. Arthur Battley of Spalding, who operated a road transport depot, began to consider alternative uses for his premises. His investigations led him to America and on his return a company was formed which has successfully built up one of the most up-to-date locker plants in Great Britain for the storage of all types of products.

IN THE course of his visit to America to examine the possibilities of deep freeze storage of foods of all kinds, Mr. Battley inspected Seabrooke Farms, New Jersey, one of the largest plants of this nature, which comprises some seven acres of deep freeze plant and storage. At this plant were seen the whole of the operations from start to finish, comprising quick freezing, canning, and bulk storage.

Mr. Arthur Battley.

He then turned his attention to the locker plant system of storage, which is very popular in the United States. Two such plants were visited—one at Gettysburg and the other at York. The storage of fruit and vegetables at these plants was particularly impressive, as were the facilities offered to the small consumer by the use of lockers.

Upon his return to England, Mr. Battley laid his plans before his present fellow directors with the result that the South Lincs. Cold Stores commenced operations in March 1950 with the idea of catering for large and small consumers and of providing bulk storage facilities.

The existing premises, which were formerly owned by Mr. Battley and used as a transport depot, have been converted with the minimum of structural alterations. Existing walls have been utilised where possible, and plans are already well in hand for further extensions to storage facilities.

Deep Freeze Storage

All goods intended for deep freezing enter the premises by way of a receiving room, where they are docketed and booked in.

Bulk supplies from the local butchers are kept either in the chilling room at a temperature of approximately 30° F. when required to be kept only for a short period of time, or they are placed in the deep freeze chamber at 0° F. where they can be held for an indefinite period. In the season large quantities of game, poultry, and rabbits are stored in either of these two chambers, depending on when they are required for use.

Of particular interest to the small consumer is the locker system of deep freeze storage. For this, one or two extra operations are carried out at the plant.

Such commodities as poultry and game are accepted in the raw state, either alive or fresh-killed. In the preparation room, they are dressed and cleaned so that they are ready for immediate consumption when collected at a later date.

After these preliminary preparations, they are then put into the chilling room for approximately twenty-four hours at a temperature of 32° F. By means of circulating fans the air is distributed throughout the room, and the dampness extracted from the commodities is dispersed, and the temperature reduced to one suitable for quick freezing.

At the end of the storage period in the chilling room, the goods are placed in the quick freeze chamber at a temperature of −20° F.,

Preliminary preparations are carried out before storing.

After cleaning and dressing, commodities are placed in the quick freeze chamber.

A wide selection of commodities can be held in the bulk store room.

Individual packages are placed in the customer's own locker for collection when required. The operation of quick freezing and placing in the individual lockers is part of the service which is available to all subscribers, and the use of this system of food storage enables them to have the benefit of consuming their own garden produce at any time of the year.

with the result that in the space of from two to three hours they are completely frozen and can be kept indefinitely.

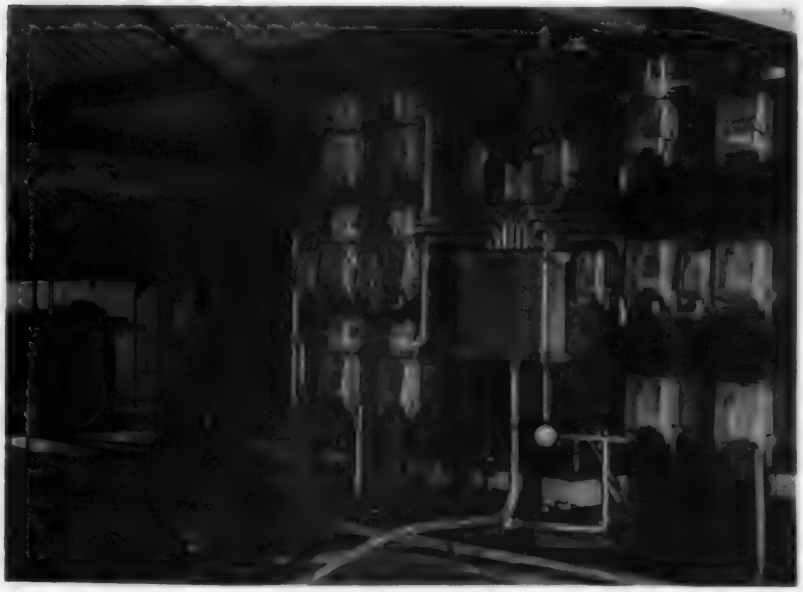
The fourth and last operation is to remove them from the quick freeze chamber and place them in each customer's individual and numbered locker for collection when required. Where collection is not possible, the goods are despatched by road or rail.

The final capacity of available locker storage will be 1,000 lockers each of 6 cu. ft. in two separate rooms, there being 500 in each room.

Although response to this service was slow at first, the demand for space is now rapidly increasing as its advantages become more generally known. Those people who already rent lockers are also being advised of the wide range of commodities that can be held in this way. Among these may be included soft fruits of various kinds, and the company anticipate that there will be a big demand this season for frozen food containers which they are able to supply. By this means, hirers of lockers will be able to have the benefit of consuming their own garden produce at any time of the year.

The rental for a 6 cu. ft. locker is £5 per annum, and although preparation and wrapping charges are extra, customers who wish may do their own preparation. The operation of quick freezing and placing in the individual lockers is part of the service which is available to all subscribers. There is also available bulk storage for separate parcels of goods which may be stored at a nominal charge per month.

Poultry, meat, and other products can be held in the deep freeze store for an indefinite period.



The control panel of the refrigeration installation which is housed on the roof of the preparation room.

Fruit and Bulb Storage

The other type of storage available which will, when completed, occupy the greater space, is reserved for fruit and bulbs. For example, apples can be kept either in ordinary cold stores or gas chambers, according to the variety and the duration of the storage period. Pears can also be accommodated when required.

Bulb storage is of particular interest in Spalding, which is in the heart of Britain's bulb-growing area. There is a large amount of storage available, most of which has already been booked for this season. Tulips form the major part of bulb storage and arrive at the store at the end of July or beginning of August. They are held at a temperature of 48° F. for approximately eight weeks. By this means growth is encouraged, with the result that they can be produced in flower at a much earlier date than in the ordinary way.

The construction of the store room is of foam slag blocks insulated with the required thickness

of cork, with the result that even with the current cut off, the temperature would rise only approximately 2° F. in twelve hours.

All the refrigeration machinery is housed on the roof of the preparation room, and consists of 5 h.p. water-cooled Freon compressors, 2 h.p. air-cooled units, and a ½ h.p. unit which serves the air lock. A central control panel covers the entire scheme.

The conclusion drawn is that this plant provides exceptional facilities for the general public in addition to retailers, wholesalers, and producers for the storage of perishable foodstuffs. The whole scheme is based on a three-year plan, and it is hoped to be able to complete it as originally intended, subject to consumer demand.

Photos Leonard Hill, Ltd.

SUPPLIERS OF EQUIPMENT

Constructional, installation, and insulation work was undertaken by the following contractors: Designed and erected by Mr. L. Bates, A.I.A.A., and S. Spalding in conjunction with Battley's Concrete Building Department; the contractors were also the manufacturers of the foam slag blocks.

The installation of equipment and the insulation with cork was undertaken by *Automatic Electrical Refrigerators*, using *York Shipley* equipment.

Water heater in preparation room: *Creda (Simplex Electric Company)*.
Air circulating fans: *Keith Blackman*.
Bulkhead lighting: *Coughtrie*.
Fluorescent lighting: *The British Thomson-Houston Co.*

New Books Register

Orders for any of the books listed below, or scientific and technical books in any language, may be placed with the Books Department, FOOD MANUFACTURE, *17, Stratford Place, London, W.1. A selected stock of books is carried and may be inspected at the above address. Prices given do not include postage.*

Baron, W. H. *Handbook of Antibiotics*. Reinhold Publishing Corporation, New York; Chapman and Hall, London. Pp. 303. 52s.

Sayres, P. (Ed.). *Food Marketing*. McGraw-Hill Publishing Co., London. Pp. 335. Illustrated. 42s. 6d.

United Nations Food and Agriculture Organisation. *Teaching Better Nutrition*. FAO Nutrition Study No. 6. H.M.S.O., London. Pp. 148. Illustrated. 10s. 6d.

Synge, P. M. (Ed.). *The Fruit Year Book*, 1950. Royal Horticultural Society, London. Pp. 154. Illustrated. 8s. 6d.

Williams, R. J. *The Biochemistry of B Vitamins*. Reinhold Publishing Corporation, New York; Chapman and Hall, London. Pp. 741. Illustrated. 80s.

Woodruff, E. V., and Lammers, H. B. *Steam-plant Operation*. McGraw-Hill Publishing Co., London. Pp. 543. Illustrated. 59s. 6d.

Wright, E. B. *Electricity in the Home and on the Farm*. John Wiley and Sons, New York; Chapman and Hall, London. Pp. 380. 32s.

Martin, G. *The Modern Soap Detergent Industry*. Vol. II. Ed. I. Cooke. Technical Press, Kingston, Surrey. Pp. 464. Illustrated. 50s.

Hall, H. S. *The Relative Importance of Utensil Sterilisation and Milk Cooling*. Temple Press, London. Pp. 16. Illustrated. 1s.

Conway, E. J. *Microdiffusion Analysis and Volumetric Error*. Crosby Lockwood and Son, London. Pp. 414. Illustrated. 25s.

Bibliography of Standard Tentative and Recommended or Recognised Methods of Analysis. W. Heffer and Sons, Cambridge. Pp. 226. 25s.

Brooke, J. *Peaches, Apricots, and Other Stoned Fruit*. Faber and Faber, London. Pp. 163. Illustrated. 16s.

Whittier and Webb. *By-products from Milk*. Reinhold Publishing Corporation, New York; Chapman and Hall, London. Pp. 317. 48s.

Gale. *The Chemical Activities of Bacteria*. Third edition. University Tutorial Press, London. Pp. 213. 9s. 6d.

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Correspondence

To the Editor of
FOOD MANUFACTURE

Alexis Soyer

DEAR SIR,—I have read your interesting little note about Alexis Soyer in the March issue of FOOD MANUFACTURE. He was undoubtedly, like Appert, a *bienfaiteur de l'humanité*, but it is not quite just to say that nothing remains to remind us of Soyer soup.

In the Army a Soyer stove is almost as familiar an item as a Balaclava helmet. It was designed by Soyer, and consists of an iron framework on four legs, which contains a coke fire in a lower chamber, and a large iron pot lowered in from the top. It is used for soups, porridge, stews, or even boiling water, and I believe is still the main piece of equipment in any field kitchen, though newer devices like petrol cookers are beginning to supplant it.

Yours sincerely,
D. J. FOSKETT,
Information Officer,
The Metal Box Company, Ltd.
London.

Editor's Note: The foregoing is one of a number of letters we have received with reference to the note about Alexis Soyer, and we have pleasure in re-establishing his name on the roll of fame.

TO AUTHORS

FOOD MANUFACTURE is prepared to consider the publication of any books on scientific and technical subjects which authors might care to submit.

Wakley of the "Lancet"—A Centenary Salute

F. LE GROS CLARK, M.A.

In this year of festivals some anxiety has been expressed lest our cooking should not be to the taste of our overseas visitors. The emphasis has shifted in a hundred years; but Thomas Wakley of the "Lancet," when he opened his campaign against food adulteration in 1851, had the Great Exhibition in mind. "During the presence of the concourse drawn to the metropolis . . . ," he wrote, "the temptation to adulterate articles of food and drink will be immense. Against this evil our Analytical Sanitary Commission will, we flatter ourselves, prove a powerful bar." Whether the foods retailed in London were then worse adulterated than those of many Continental capitals, it would be hard to say. Probably they were; at all events Wakley and his colleagues, Hassall and Letheby, demonstrated that there was much more adulteration in the metropolis than in the provincial cities.

IF Wakley was aware of the crude adulterations of milk, bread, tea, and confectionery, that were prevalent in his time, he could not have envisaged the new preservatives and insecticides that are today troubling our food chemists and administrators. One plague passes and another succeeds it. At bottom it is the problem of a complex and changing civilisation. As soon as food has to be transported, refined, preserved, and sold over the counter, it obviously ceases to be the "natural" food of man; and in various ways it may have deteriorated.

Changing Problems

Let it be assumed that the primitive human stock found a "natural" dietary wherever they had their habitat. They may have come to it through a process of trial and error; but the diet was sufficient for their needs. By a century ago, three main difficulties had arisen. First of all, a large body of urban consumers were being cheated or defrauded; they were not getting what presumably they thought they were paying for. Secondly, some of them, though but a small minority, were being poisoned, especially through the medium of sweets, confectionery, table jellies, and the like. Thirdly, though this at the time may have been less apparent, they must have suffered nutritionally from the loss of properties in the food. The two former evils exercised the minds of the *Lancet* Commission and of legislators and reformers for the next eighty years or so; the last consideration has only had its full effect since the public became conscious in the 'thirties of the meaning of possible vitamin or mineral deficiencies.

Wakley, of course, had no illusions about the importance of an adequate diet. "Uncontaminated air and pure water," he wrote in his introductory article, "are now regarded as necessary to the maintenance of a healthy existence. . . . That unadulterated food, the bone and muscle of the body, is not less requisite, will be readily allowed, and it will appear on reflection as somewhat remarkable that the interests of the public in this important particular should not hitherto have been watched over and protected by any authorised body or commission."

In the paper he published on milk, Hassall noted its significance in the diet of all children; and while he refused to substantiate the stories of its adulteration with chalk, he agreed that many of his samples were watered. By their showing, however, the public was being defrauded rather than malnourished, even if some of the current practices were objectionable in the extreme.

Start of the Campaign

Thomas Wakley (1795-1862) was one of the great reforming figures of his time; and to him in the present year learned societies have paid a centenary tribute. His work against the adulteration of food was among the more lasting of his campaigns, for it led immediately to the passing of the first Pure Food Act in 1860 and thence to all the legislation upon the subject that has followed. As a boy he knew something of the sophistication of drugs; at the age of fifteen he had been apprenticed to a Taunton apothecary named Incledon.

Later, in 1831, O'Shaughnessy, who assisted on the Commission of 1851, had published in the *Lancet* an article on poisons in confectionery. Wakley's mind was thus prepared for the subject, when in 1850 Arthur Hassall (1817-1894), a still youthful doctor recently arrived in London, read before the Botanical Society a paper on the adulteration of coffee. Between the two of them the form of campaign was agreed, and a room in the *Lancet* offices was fitted out as a laboratory.

Social Stirrings

Wakley and Hassall had what we should call a very good press. The leading daily papers took up the subject; so later did the reviews; and the usual popularisers and satirists were not lacking. Although it is doubtful whether bread could have been adulterated to any extent with plaster and chalk, Tennyson did refer to the practice in his "Maud"; and the concern with the food of troops in the Crimea fitted very neatly into the same pattern of general anxiety. Public meetings followed, mainly in the cities of the West Midlands, where the medical fraternity had been specially stirred by the disclosures; and

Parliament began to take notice at last in 1854.

The *Lancet* campaign seems still to have been fresh in the public mind during the 'sixties, for we find Kingsley in his "Water Babies" (1863) making reference to it, as though he supposed his readers would be familiar with the facts. He wrote of "foolish and wicked people who make trash full of lime and poisonous paints, and actually go and steal receipts out of old Madame Science's big book to invent poisons for little children, and sell them at wakes and fairs and tuck-shops. Very well. Let them go on. Dr. Letheby and Dr. Hassall cannot catch them, though they are setting traps for them all day long." What would most modern parents make of this remote allusion?

Wakley owed his success partly to his daring resolve to publish, after due warning, the names of offending vendors. There were apparently no Court cases; and this must usually have been due to the fact that no analytical chemist could be found to swear that samples of the incriminated foods were not adulterated in the manner vouched for by Hassall.

Through the Century

In the 'seventies the Society of Public Analysts was founded. Two Acts not only made their appointment compulsory for all local authorities, but laid it down finally that a public analyst might, in taking samples of food, represent the interests of the consumer. A curious sequence of Court rulings had for a while left it doubtful whether an analyst, who was not buying the food for his own consumption, could be held to be prejudiced as a customer. The community now handed over to a body of experts the function of protecting it from frauds practised upon its food. This was an advance, since it tacitly assumed that the consumer cannot judge for himself the quality or composition of all the food he purchases.

In the next stage the problem of standards arose. Did the same word always objectively mean the same commodity? Analysts found that they were not invariably adopting the same standards of purity; and indeed they could hardly be expected to do so. Moreover, the issue might become complicated in a Court of Law, because the purchaser would have to prove that he did not get what he supposed himself to be asking for. Save for a few commodities the matter was in no sense decided, until the 1938 Act at last gave the Ministry of Health some powers to establish standards of quality and composition; and of these powers the Ministry of Food has been taking advantage.

The Latest Phase

The concluding stage in the process is that relating to the nutritional or dietary properties of a food. A food is, as we now realise, a complex substance, possibly containing not only minerals and vitamins but also proteins that are themselves a complex of factors. A consumer may be said to "expect" that he will absorb from his food all the nutrients it is reckoned to provide; and it does not matter whether he is conscious of expecting this or not, for obviously he is in most instances not versed in the latest nutritional theories. He has to depend on the word of the expert.

It was unlikely that much would be said about the nutritional properties of food, until vitamins had become generally recognised. But the concept was embodied in the 1938 Act; and here again the Ministry of Food was fairly quick to seize its opportunity. It expanded the terms of the Act to imply that there must be no misleading claims made, not only about the quality, substance, and composition of a food, but in particular about its nutritional or dietary value. This interpretation has not yet been embodied in legislation; but there can be little doubt that it will form part of any new consolidating Act that Parliament sees fit to pass.

This, however, is not quite sufficient, although it goes some way to safeguard the consumer. Nutrients may be affected in two degrees. They may be removed from or destroyed in the food in the course of refining, heating, or storage; and they may be rendered partially or wholly unavailable to the consumer through the action upon them of various preservatives or other chemical compounds in the food.

Science of Food Production

Indeed, the matter does not end here. The science of food production is changing continuously; and no one can be certain how far new modes of production will not affect the nutrient composition of the resulting food. For instance, a special type of fertiliser dressing may well tend to produce larger oranges or tomatoes of good quality, but it is by no means sure that their vitamin content is raised proportionately. How, then, shall the consumer be guaranteed that a given food is providing him with all the nutrients he has a right to expect?

New Troubles for Old

This is largely a matter for experts, though in some measure the consumer needs to be trained to look at labels and to understand what they are trying to tell him. Clearly the most difficult problem is that of the use of various insecticides and preservatives. In so far as they contaminate the food they enter into the processes of the body; what may ultimately happen to them there, heaven alone knows.

If they affect the digestive tract immediately as toxins, the symptoms are usually obvious enough. If they are absorbed, some portion of them may tend to block the assimilation and use of a specific vitamin or amino acid; and in that case the metabolic consequences may be long delayed and remote. The body has a remarkable way of adapting itself, at a cost, to influences of this nature; and the symptoms, when they emerge, may seem to have no direct relation to the cause. Evidently the only way is that of forbidding the use of chemical compounds to which the slightest suspicion attaches.

The Report of the Medical Research Council for 1945-8 aptly balances the comments of Wakley

a century ago. "We have to take account," says the writer, "of the possibility of harmful effects from these chemical admixtures.

"From time to time special committees have been set up to report upon the safer and the more harmful chemical agents used in the preparation of foods. Occasionally, certain chemical forms of treatment have been condemned, and permission to use them has been either refused or given only within prescribed limits. . . . The matter is clearly one upon which judgment must be reserved, especially since the last fifty years have seen an apparent increase in this country of a number of diseases, especially abdominal conditions such as gastric and duodenal ulcer, appendicitis, and colecystitis, of which the origin is very obscure, and it is during this time that chemical sophistication of food has become so common. . . . It is clear that here is a warning not to be disregarded, on the possible dangers associated with the chemical treatment of food; and it is to be hoped that in the future . . . scientific work will be directed to the detection of possible harmful effects."

There seems no escape from the law that the ills produced by scientific progress can be exorcised only by the injection of still more science. As in Wakley's time, the trouble will be met only (as someone has remarked) by the simple expedient of "setting a chemist to catch a chemist." The reports of the various committees at work upon these problems should carry us a stage further along the path of civilised existence.

Future Articles

ARTICLES appearing in future issues will include "Progress Report on an Investigation of the Effect of Ultra-violet Rays on Flour," by E. Maes, M. Bauwen, A. R. Deschreider, and S. van den Driessche; "The Evolution of the Modern Pig," by Collan E. B. Brett; and "Evaporation: Performances of Evaporators, New Uses, Calculations, Scale, and Corrosion," by J. M. Coulson.

Milk and Dairy Products Analysis

AN essentially practical book* of a standard readily intelligible to the dairy laboratory assistant has been written by Prof. J. Lyons and Dr. M. J. O'Shea of University College, Cork.

Two features of the book which appeal most to the reviewer are the wide historical background given to the subject and the simple language in which it is written. All too frequently routine workers have been taught how to carry out particular types of determinations without knowing why they are doing so or how one determination is connected with another. In giving so much space to the history of the subject some may feel that too many obsolete attempts to find an approximately accurate method of assaying the fat in milk and dairy products have been given, but each of these is described very briefly and serves to inform the student of the part they played in this systematic development.

The authors make no attempt to cover the ground of the larger scientific books, but there are numerous references to such works as "The Chemistry of Milk" by Davies, Richmond's "Dairy Chemistry," and other analytical treatises, as well as to certain articles in scientific journals and to British Standard Specifications, which should help the student to learn how to use the literature.

The greater portion of the volume is devoted to those determinations generally in use at the present time for the routine analysis of milk, butter, cheese, cream, ice cream, condensed milk, and milk powder, together with tests for their hygienic quality. An appendix to the volume gives questions, which it would be well if every dairy chemist could answer without having first to refer to the book.

There are one or two places where the authors appear to have gone slightly astray. On page 24, for example, they state that lactic acid gives milk its sour odour, and on pages 62 and 63 the reader is informed first that he should not blow down a pipette because the pipette delivers the correct quantity of milk; later he is informed that an 11 ml. pipette delivers only 10·9 ml. of milk on account of its viscosity. The impression, generally neglected, is that milk pipettes should be standardised to deliver 11 ml.—T. McL.

* *Commercial Methods of Testing Milk and Milk Products.* By J. Lyons, M.Sc., A.R.C.Sc.I., N.D.A., N.D.D., and M. J. O'Shea, B.A., M.Sc., Ph.D. Pp. 218. Cork University Press and B. H. Blackwell, Oxford. Price 15s.

Alimentary Pastes

THE products of the macaroni industry have become popular in Great Britain only during the last few years, whereas in Italy the total yearly production for home consumption corresponds to the value of £1,300 million, in France £600 million, and in the U.S.A. £1,100 million.

A recently published book* covers the manufacture of macaroni products and the specialised machinery needed for their production. The actual blending, dosing, and mixing, both by the batch and continuous systems, are described, and one chapter is concerned with typical extrusion presses. Other chapters deal with the drying operation and the testing, storing, and packing of the products.

The book includes illustrations of the different types of plant used, but the author, in his preface, says: "The majority of the machines and processes mentioned in this book are covered by Letters Patent, including patents that are still pending. No mention of patents has been made, as it has been found impossible to make a complete up-to-date list as many items in the book are protected by patent applications which may lead to Letters Patent at any time." It will therefore behove the intending manufacturer to satisfy himself that he is not likely to infringe such patents. Nevertheless, he will gather a sound notion of processes as a whole from this publication.

* *Macaroni Products.* By Dr. Charles Hummel. Pp. 223. Food Trade Press, London. Price £2.

Ministry of Food

LATEST STATUTORY INSTRUMENTS

The list given below is the continuation of the list of Instruments published in "Food Manufacture," March 1, 1951, page 98.

No.	Date 1951	
		PRICE FIXATION
22	Jan. 14.	Order revoking the Milk Powder (Maximum Prices) Order, 1947.
75	,, 21.	Order amending the Bacon (Control and Prices) Order, 1950.
138	Feb. 1.	Order amending the Milk (Control and Maximum Prices) (Great Britain) Order, 1947. Revokes S.I. 1950, No. 1433.
236	,, 18.	Order amending the Feedingstuffs (Prices) Order, 1950. Revokes S.I. 1950, No. 1118.
314	Mar. 4.	Order amending the Meat Products and Canned Meat (Control and Maximum Prices) Order, 1948.
345	,, 18.	Order amending the Imported Canned Fish (Maximum Prices) Order, 1950.
415	,, 18.	The Meat (Prices) Order, 1951. Revokes S.I. 1949, Nos. 778 and 1637; S.I. 1950, No. 319.
416	,, 18.	The Meat (Prices) (Northern Ireland) Order, 1951. Revokes S.I. 1949, No. 783; S.I. 1950, No. 318.
		BREAD
258	Feb. 18.	The Bread Order, 1951. Revokes S.R. & O. 1947, No. 1867; S.I. 1948, Nos. 1750 and 2612; S.I. 1949, Nos. 169, 1778, and 1944.
		CEREAL FILLERS
51	Jan. 21.	The Cereal Fillers Order, 1951. Revokes S.R. & O. 1944, No. 660; S.R. & O. 1945, No. 230; S.I. 1949, No. 1823.
		CHOCOLATE AND SUGAR CONFECTIONERY
20	Jan. 10.	Order amending the Chocolate, Sugar Confectionery, and Cocoa Products Order, 1949.
417	Mar. 15.	The Chocolate, Sugar Confectionery, and Cocoa Products Order, 1951. Revokes S.I. 1949, Nos. 781 and 1524; S.I. 1950, Nos. 190, 1430, and 1488; S.I. 1951, No. 20.
		DRIED FRUITS
37	Jan. 14.	The Dried Fruits Order, 1951. Revokes S.I. 1949, No. 2366; S.I. 1950, Nos. 844 and 1070.
516	Mar. 29.	The Dried Fruits (General Licence) Order, 1951.
		EGGS
426	Mar. 23.	Order amending the Eggs (Great Britain) Order, 1950.
		FEEDINGSTUFFS
494	Apr. 1.	The Feedingstuffs (Prices) Order, 1951. Revokes S.I. 1950, Nos. 424, 991, 1541, and 2018; S.I. 1951, No. 236.
		FLOUR
530	Apr. 1.	Order amending the Flour Order, 1947. Revokes S.I. 1949, No. 1779.
		FRUIT
525	Apr. 2.	Order amending the Bananas Order, 1948. Revokes S.I. 1950, No. 616.
		HOME-GROWN GRAINS
493	Apr. 1.	Order amending the Barley Order, 1950.
496	,, 1.	Order amending the Oats (Great Britain) Order, 1950; and the Oats (Northern Ireland) Order, 1950.
497	,, 1.	Order amending the Dredge Corn (Great Britain) Order, 1949; and the Dredge Corn (Northern Ireland) Order, 1949.
		ICE CREAM
13	Mar. 1.	The Food Standards (Ice Cream) Order, 1951.
67	Jan. 18.	The Ice Cream (Heat Treatment, etc.) Amendment Regulations, 1951.
		LABELLING
462	Mar. 23.	Order amending the Labelling of Food Order, 1950.
		LICENSING OF RETAILERS
315	Mar. 1.	Order amending the Food (Licensing of Retailers) Order, 1948.
		LINSEED
76	Jan. 21.	Order revoking the Home-grown Linseed (Control) Order, 1948.
		OILS AND FATS
21	Jan. 10.	Order amending the Oils and Fats (No. 2) Order, 1949.
125	,, 28.	Order amending the Oils and Fats (No. 2) Order, 1949.
		POTATOES
289	Feb. 23.	Order amending the Seed Potatoes Order, 1950.
301	Mar. 1.	Order amending the Ware Potatoes Order, 1950.
		RATIONING
288	Feb. 23.	Order amending the Rationing (Personal Points) Order, 1950.
418	Mar. 23.	Order amending the Rationing (Personal Points) Order, 1950.
		SOAP
163	Feb. 4.	Order amending the Soap Order, 1950.
		SOFT DRINKS
137	Feb. 1.	Order amending the Soft Drinks Order, 1949. Revokes S.I. 1950, No. 596.

An Improved Bacon Smoking Technique

A. J. THOMPSON

The present method of smoking bacon by the smouldering of sawdust on the smokehouse floor has so many shortcomings that it is surprising the system is still practised extensively. Until recently no serious attempts appear to have been made to overcome its inherent disadvantages, but a new technique which has been developed retains the best features of the present method and also eliminates its defects without the complications of mechanical devices.

THE process of bacon smoking combines to produce different effects. Apart from its preservative action, the characteristic taste and aroma of smoked meat are imparted by the creosote vapours distilled from the burning sawdust.

For the sawdust, Hickory wood is considered by some curers to be the best, with certain hardwoods following closely behind.

The most important features are:

1. The removal of the desired amount of moisture.
2. The speed of penetration of the acidic vapours from the smoke into the meat.
3. The attainment and control of the critical temperature beyond which the softening of the lighter fatty substances occurs.

Disadvantages of Present System

Perhaps the most serious disadvantage of the present method is the complete lack of temperature uniformity and control in the smokehouse with the attendant risks of excessive shrinkage and scorching which, in the latter case, can lead to fat loss. In addition, contamination of bacon by fly ash is difficult to avoid, there is an ever-present fire risk, and working conditions for operatives leave much to be desired.

When wet or refrigerated bacon is placed in the smokehouse, the drips cause patches of smouldering sawdust to be extinguished, and in cold weather difficulty is frequently experienced as a result of staining of the sides of bacon by condensation from the roof.

As the bacon must remain in the smokehouse until the sawdust has finished smouldering and the temperature falls, there is no positive control of the smoking period, and labour arrangements must of necessity conform to these periods.

The whole procedure is one of chance, and due tribute must be accorded to the skill of the operatives who are responsible for bacon smoking by this time-honoured but primitive system.

Design of New Equipment

In designing equipment to overcome the inherent faults of the present method the obvious step was to supply a medium for heating the smokehouse which could be easily controlled. For this purpose steam, gas, or electricity is admirable, and by employing a smoke generator unit either below or adjacent to the smokehouse all the shortcomings of the present method can be obviated while other advantages accrue.

By dissipating the heat in the smoke in its passage through the ducting, the temperature in the smokehouse is kept at the desired level by the steam pipes, or gas or electric heaters, either of which can be thermostatically controlled or manually adjusted in conjunction with a dial thermometer so that the temperature of the smokehouse is at all times under the control of the operator. This has an important bearing on the shrinkage and speed of drying and also on the time taken for the bacon to cool after smoking.

Development of New Principles

The immediate advantages of the modern method of bacon smoking are as follows:

Levelling the sawdust in the combustion chamber.

Bacon is loaded for smoking.

1. Uniformity and control of temperature in the smokehouse, giving flexibility, control of shrinkage, speed of drying and cooling, and avoidance of staining of bacon by condensation from the roof.
2. Elimination of fly ash settling on bacon, virtually no fire risk, substantial saving of sawdust, better working conditions, and cleaner bacon.

A system based on the principles outlined above has been developed which consists essentially of a brick-lined sawdust combustion chamber with damper controlled smoke ducts through which smoke passes into the smokehouses through grids in the floor of the smoking chamber, dissipating the majority of its heat in its passage. Arrangements are also made so that all or part of the total smoke generated can be exhausted to atmosphere if required. The system of damper controlled ducts permits the volume of smoke entering the smokerooms to be regulated, and also enables a smokeroom to be cleared of smoke within minutes by shutting the smoke damper and opening the top ventilators.

Air shutters in the charging doors of the sawdust combustion chamber, operated in conjunction with the top ventilator or fans in the smokerooms, give complete control over the rate of sawdust burning and smoke generated.

The sawdust combustion chamber is best situated below the smokerooms, as this obviates the need for any mechanical equipment, but where the site does not allow this, as may well be the case where conversion of existing smokehouses is contemplated, the sawdust combustion chamber may be located outside the smokehouse at floor level and the smoke distributed by a fan through ducts let into the floor.

The most important and attractive feature of this equipment is the fact that a more economical loading factor in the smokerooms is attainable. With the use of sawdust on the floor, the lower rails must of necessity be high enough to prevent the bacon being scorched, with the result that a large portion of the smokeroom, which incidentally is generally the

Interior of the smokeroom.
Photos The Dowson and Mason Gas Plant Co.

most convenient for hanging sides of bacon, is completely wasted. With the introduction of a separate sawdust combustion chamber, a lower set of rails can often be incorporated, thus materially increasing the capacity of smokerooms and making easier handling possible.

The difficulties of obtaining building licences, high costs of building, and the intricacies of Town and Country Planning make this feature of space utilisation worthy of consideration.

Mechanical Handling Methods

A great deal of attention has been given to the mechanical handling of bacon, and in large organisations the mono-rail system has been adopted for this purpose. With a modern plant it is not difficult to extend the mono-rails into the smokeroom to form the lower tier, thus going some way towards easier loading. In practice it has been found that the use of less sawdust materially reduces the thickness of the tarry deposits on the walls and rails; apart from improved cleanliness, this is important when considering schemes for mechanical handling of bacon sides.

Reducing Drying and Smoking Times

Recent developments in fish smoking have focused attention on reducing the period of the drying and smoking time for bacon, and some concerns have experimented with this in mind. While there is little doubt that the drying time can be shortened, there is obviously a limit to the speed at which moisture can be drawn through flesh. By means of passing relatively large volumes of air over the surface of the bacon, moisture can be taken from it and colour given to the bacon by the smoke, but usually only at the expense of rind hardening and soggy interiors.

The flexibility of the modern system permits controlled drying by means of temperature uniformity and control.

To illustrate the drying effect, let it be assumed that air is taken from the outside at 60° F. and at a relative humidity of 50 per cent. If this air is heated to 90° F., its relative humidity will be changed to 19 per cent. Under these conditions it is in effect dry and capable of carrying water vapours absorbed from the meat in its upward travel to the top ventilators. Very dry conditions of the air can be achieved by heating, provided care is exercised in the control of temperature to avoid excessive shrinkage.

An adequate control of temperature also assists in the cooling of the bacon, as the heat can be shut off towards the end of the smoking period depending on the "wetness" of the bacon being smoked. This, coupled with the ability to clear a smokeroom within minutes, permits of more rapid handling of bacon than with the old method.

The system lends itself to the small as well as the larger bacon smoker. In the latter category, continuous feeding of sawdust can be easily arranged, and any number of smokerooms can be fed with smoke by means of ducting if desired.

Protein Requirements Research

CONTRIBUTIONS by five leading American experts in the protein field are contained in a recent volume* which may be strongly recommended to those requiring up-to-date specialised knowledge on the subjects covered.

In the first chapter, H. H. Mitchell deals with the effect of species and age on the requirement for amino acids. He mentions, for example, the interesting point that the sheep, in its later stages of development, requires more protein for the growth of its wool than for producing mutton.

Douglas V. Frost then reviews methods for measuring the nutritive value of protein hydrolysates and amino acids by experiments on rats, and shows how the nutritive value of a protein may be predicted from its chemical analysis.

A chapter on the laboratory evaluation of amino acid mixtures and protein hydrolysates by Robert H. Silber and Curt C. Porter follows, and Bacon F. Chow discusses the influence of dietary proteins on the synthesis of tissue proteins.

The editor concludes with a stimulating review of the protein and amino acid requirements of man, which covers the influence of vitamins and hormones on protein metabolism.

The libraries of all institutions concerned in research on food, and of all firms engaged in its manufacture, should find this work a worthy addition to their shelves. It cannot claim to be a complete textbook, and little attempt is made to cater for those who do not already possess a sound elementary knowledge of the chemistry and biochemistry of the proteins. In these days of intense specialisation, however, it is doubtless sufficient that the authors have fully succeeded in their intention of reviewing recent accomplishments in research on protein requirements, and in indicating the need for further efforts before the effects of growth, maturity, and senescence are properly understood in all animals. —T. M.

* *Protein and Amino Acid Requirements of Mammals.* Edited by Anthony A. Albanese. Pp. x+155. Academic Press Inc., New York. Price 30s.

Tax Assessments

THE present high level of taxes makes the appearance of a recently published book* both timely and valuable.

The author believes that many income tax assessments are made which should be contested. Some, he states, are "try-ons," the tax officials thinking thereby to force the assessee to come out into the open; others are excessive because the taxpayer has neglected to fill in a return or otherwise to furnish proper information. Thus the basis of his approach is to fulfil two aims: to overcome the reluctance of many to initiate an appeal, and then to show how to set about it. The book is packed with facts which every taxpayer should know.

* *How to Appeal against Tax Assessments.* By J. H. Burton. Pp. 210. Jordan and Sons, London. Price 12s. 6d.

All About Apples

REVIEWERS differ in their approach to various books which it becomes their duty to examine in the interests of the reading public. Sidney Smith said: "I never read a book before reviewing it; it prejudices a man so!" Those readers of FOOD MANUFACTURE who can still find time to browse on topics other than those associated with their work may perhaps find respite in Macaulay's "Critical Essays," which are all based on reviews of contemporary books of importance. Macaulay, despite his magnificent memory, read and re-read some of the review copies—such as Mr. Gladstone on "Church and State," "Frederick the Great," and "History of the Popes." His reviews became major contributions in themselves to the subjects under consideration; they could be complimentary or, as Mr. James Montgomery, the poet, found to his cost, they could castigate the authors with violence and bitterness.

The fact that Macaulay in one of his Essays reviews the subjects from the point of view of the public for whom it was intended suggested to the present reviewer that his first personal impression of this book* on apples and apple products had been too hasty and superficial as a result of a dutiful single reading of the entire book.

First Impressions

The impression left at first was that the book covered its enormous field by means of stringing together 906 summaries of technical or scientific papers—for such indeed is the number of references quoted throughout the book. The reviewer could find very little sign of a critical presentation of the data; all facts weighed in an equal scale with each other; no editorial or other censure was passed on certain results. Everything was positive, unsolved problems seemed always to be in the background, and a feeling of false satisfaction that there were no outstanding disputes on the apple front was experienced.

From Farmers to Pathologists

To examine in a critical way all the literature cited in this book would have doubled or trebled its size, but it was in thinking over this precise problem, and the very real deficiency that the lack of critical outlook occasioned, that the reviewer took the trouble to read the publishers' note to their public. It is worth quoting *in extenso*: "A presentation of the chemical composition, biochemical and physiological behaviour, botanical aspects, and productive factors for food processors and nutritionists, and of the methods of utilisation and processing for soil scientists, farmers, horticulturalists, physiologists, and plant pathologists."

Without intending to be unkind, it is rather as if a new textbook in general knowledge had been written in which the physics chapters were written especially for history students, and the explanation of the religions of the world was specially prepared for those studying soil science! This separation of interests accounts principally for some of the feeling of discontent experienced on the first reading.

The first half of the book was written apparently for members of the Food Group and Nutrition Society who were interested in apples, while Mr. Neubert's chapters have a very wide public in mind, stretching from farmers to pathologists. Now, this being so, and this being the general basis of the layout of the book, the reviewer's criticism must to some considerable extent be modified.

Remarkable Array of Facts

A farmer could not, and would not, wish to be laden with the *minutiae* of pectic enzyme literature; his interest lies in how to keep apple juice clear from cloud and deposit. On this basis, it must be admitted that the two joint authors have amassed a remarkable array of information, and have arranged it in a suitable series of chapters to make reference easy for the classes of readers for whom the book was published. Both authors are well known for their own contributions to the scientific development of their respective subjects, and have obviously been at great pains to be inclusive, whereas in some cases an exclusive attitude might have served the reader more faithfully.

The book consists of the following sections: history; varieties; developments and structure of the apple; environmental and cultural factors in chemical composition and physiology; chemical changes in apples on the tree and after harvesting; fruit maturity and quality; pre-storage treatments; storage of apples in fresh condition; storage troubles; and processing of apples of all kinds—drying, canning, freezing, and the manufacture of juices, syrups, concentrates, jams, butters, jellies, cider, pectin, and pomace.

Arrangement of Bibliography

Each chapter is well documented with references at the bottom of the appropriate page. This is a departure from normal practice, and was found to be very convenient for checking up, except that where the author had presumably unearthed a reference after his main bibliography had been completed and had been forced to resort to little "a's" and "b's," the printers had descended to such minute characters that Sam Weller's "patent double million magnifyin' gas microscopes of hextra power" are needed. There are excellent author and subject indexes which have been tested and found amply inclusive. No one engaged in the apple industry could read this book without learning much that was new to him, but whether he learnt much about his own particular branch must depend on what that subject might be.

This review has so far swung

* *Apples and Apple Products.* By R. M. Smock and A. M. Neubert. Vol. II of Economic Crops Series. Gen. Ed., Z. I. Kertesz. Pp. xvi+486. Interscience Publishers, New York and London. Price £3.

openly and frankly from one view to another. In conclusion, one or two particular remarks may be allowed about items of interest in the book. It was most annoying on page 124, for instance, to find a table of vitamin C contents of apples, with the vitamin ranges clearly set out in tabular form, and to be given, as if one needed a digestive tablet, in another column, an "approximate rating as a source of ascorbic acid"; the column consists of terms such as "good, fair, excellent," etc., and these follow the figures in the preceding column with absolute regularity. A farmer with no pretensions to scientific knowledge might well feel insulted at having such straightforward figures so fully explained!

The language of the book is clear, and adequate for the purpose, but the first sentence on page 23 has caused some puzzlement. Mr. Neubert bursts on us with the astonishing fact that the history of cider manufacture coincides with that of apple juice! Cider has been known for at least 1,000 years, while juices in an unfermented condition hardly go back beyond fifty years. His attempts to justify the initial statement get him into even deeper water, *e.g.* "During the early history of juice manufacture, preservation methods were unknown, and it is safe to assume that most of the juice was consumed in the fermented form"!

The references to the literature are very catholic in those chapters in which the reviewer is particularly interested. It is splendid to see so many British, German, and French references scattered throughout the main American contributions.—V. L. S. C.

Pectin Survey

COMPRISING a survey of the literature on an important class of gelling agents, a recent German book* should be a welcome addition to the reference library of food manufacturers and chemists since it epitomises the main scientific and industrial developments of the last two decades.

During this period the output of papers and patents in this field has been prodigious (an examination of the Fourth Decennial Index of Chemical Abstracts revealed the existence of at least 500 original publications between 1937 and 1946), but the important task of selecting and condensing the mass of information to bring it within the confines of a single volume has hitherto been strangely neglected. The most recent authoritative books are those of W. A. Rooker (1928) and C. L. Hinton (1939).

Dealing mainly with comparatively recent developments in the extraction, analysis, and utilisation of pectins, the book's introductory chapters provide the historical and scientific background indispensable to a balanced view of the subject. A welcome feature is the adoption of the nomenclature on pectins recommended by a committee of the American Chemical Society in 1944, for an internationally standardised terminology is all-important if confusion is to be avoided in the statements of writers of different nationalities when referring to highly complex natural products.

On the more practical side the subject matter is treated under five main headings: extraction of highly esterified pectins; partially de-esterified pectins, pectic acid, and pectates; detection and analysis of pectin; the pectin enzymes; and the applications of pectins and the industrial importance of their natural occurrence.

Due recognition is given throughout to the outstanding British and American achievements of the past twenty years, and the problem of bringing the record up to date has been solved inasmuch as papers appearing in 1950 have been taken into consideration. A comprehensive bibliography (347 references) and good subject and author indexes round off the work.—L.L.

* *Die Pektine und ihre Verwendung* (*The Pectins and their Utilisation*). By Beatrix Hottenroth. Pp. 210. R. Oldenbourg, Munich. Price DM. 11.

Chromatography in the Sugar Industry

THAT separation of sugars of interest to the sugar industry could be made rapidly and quantitatively by the procedure used by Dr. S. M. Partridge of the Low Temperature Research Station was shown by H. C. S. de Whalley, M.I.Chem.E., F.R.I.C., N. Albon, B.Sc., A.R.I.C., and D. Gross, Dip.Ing., Ph.D., in a paper presented at a joint meeting of the Society of Public Analysts and Other Analytical Chemists and the Food Group of the Society of Chemical Industry.

Heat degradation products of fructose, the more labile reducing sugar, were separated and, by cooperation with F. W. Zerban and L. Sattler, were found to be identical with the non-fermentables of cane molasses. Some "compounds" were shown to be mixtures.

Use of Paper Chromatography

By paper chromatography, raffinose in raw beet sugar could be estimated with precision and certainty for the first time. The degree of purity of sugars such as raffinose had been determined. Freedom from traces of sucrose could previously only be inferred, as the exact physical constants of the sugar were open to conjecture.

Mixtures of starch hydrolysis products, such as those present in beer, could be separated and identified quantitatively.

The Lobry de Bruyn conversion could be demonstrated by means of paper chromatography, to show the equilibrium concentrations of glucose, fructose, and mannose and also the presence of another sugar, allulose.

At intermediate stages of sucrose inversion by invertase the appearance of at least one synthesised trisaccharide had been noticed.

Chromatographic methods made examination of the organic and inorganic non-sugars, including colouring matters, a relatively simple matter, but much further investigation into the identification of the separated products was required.

The Use of Fluorescent Tracer Agents

J. A. RADLEY, M.Sc.(Lond.), F.R.I.C.

The many analytical uses to which the fluorescence behaviour of organic and inorganic compounds irradiated with ultra-violet light can be put, in the food and other industries, have tended greatly to overshadow the less spectacular but nevertheless occasionally important uses to which fluorescent compounds and reactions giving fluorescent end-products lend themselves in other directions. Some manufacturers have found these uses to be of great value in assisting them in their marketing arrangements by preventing fraud, detecting sales of substituted products under their label, indicating undesirable customers, and tracing certain faults in the factory. In short, whenever an article is required to be "tagged" or "labelled" in an invisible and harmless manner, so that only the maker can identify it, then the "fluorescence tracer" technique can be applied.

SOME substances show a pronounced fluorescence in an appropriate solvent at dilution as low as 1 in 10^{-7} to 10^{-8}, and it is possible in many cases to work with a very low proportion of the "tracer" in an article and to concentrate it by suitable, rapid means when testing the product. For concentration of the tracer the use of ion exchange resins, capillary strip analysis, and selective absorption may be used.

Effect of Ultra-violet Radiation

When ultra-violet radiation falls upon a substance it may be reflected unchanged, or absorbed and converted to heat or to some other form of energy. When the energy change results in the emission of radiation of a different wave-length, the phenomenon is called *luminescence*. If the emission ceases immediately the irradiation is interrupted, the term *fluorescence* is applied. If it continues for an appreciable time after the irradiation ceases, it is known as *phosphorescence*.

Fluorescence, or the emission of radiation during excitation with radiation of a different wave-length, may be in the visible region, when the substance "glows" while it is illuminated, or it may be in the ultra-violet or infra-red region, in which case it is invisible to the eye. Fluorescence is practically always of a wave-length longer than the radiation exciting it, so that, for example, some substances may be irradiated with the very short wave-lengths in the X-ray region, and the fluorescence is situated in the ultra-violet region, or in the visible region. Others irradiated with ultra-violet light emit a fluorescence in the visible region, and some substances irradiated by visible light give a fluorescence in the infra-red region.

The only region concerned with this discussion is that between 3,000 and 4,000 A.U. (the near ultra-violet region) as the exciting source, giving fluorescence effects lying in the visible region. Special effects can be obtained using shorter wave-lengths to excite substances not so affected by the long wave-length rays. The fluorescence effects obtained vary from substance to substance, the colours shown ranging throughout the visible spectrum and the intensity varying from brilliant to dull. Some substances fluoresce only when dissolved; others only when applied to certain substrates, such as paper; others fluoresce to an appreciable extent only when in the solid state. All this has an important influence on the choice of fluorescent substances for a particular use.

Source of Ultra-violet Light

The source of ultra-violet light may be any of the arc lamps or quartz discharge tubes on the market for this type of work or for medical work. For fluorescence work, however, an essential component of the lamp system is the dark glass filter which transmits the ultra-violet light from the lamp, but absorbs all the visible light given out, with the exception of a small amount of violet or red light. The lamp is contained in a light-tight lamp housing which has the dark glass filter in a suitable position in one of the walls.

Two very useful and cheap sources of ultra-violet light are small quartz mercury arc lamps enclosed in the bulb of black glass which acts as the filter and allows only ultra-violet radiation to pass. They can be plugged into the ordinary house circuit providing the correct choke is used. The cost of the bulb and choke is only a few pounds.

Some Uses of Fluorescence

As an example of the use of fluorescence, some years ago a firm disposed of some of their products, which had been rejected on quality grounds in the factory as waste product not fit for human consumption. To their alarm they began to receive complaints of quality from the public. It was not possible to identify which merchant had been guilty of passing on the poor material for human consumption or to find out whether this had been deliberate or accidental, so that on the next occasion rejects were accumulated, only very small parcels were offered, each tagged with a different tracer. One complaint arose after this disposal, and by characterisation of the tracer the merchant responsible was identified, and appropriate action taken.

In some cases, products of the same class on the market are so much alike that it is not easy to

distinguish between them except by detailed examination and analysis. One manufacturer regularly incorporates a minute fraction of a fluorescent compound which enables him to identify his product at a glance under the lamp. This technique is capable of almost infinite variations in the tracer used which can be selected for suitability for the product and the purpose required, and has been of value on several occasions in detecting "black market" operations.

Another use for fluorescent tracers has been the application of the usual packer's number and date stamp to packaging material, using colourless materials which fluoresce under ultra-violet light. In some instances, manufacturers have, for one reason or another, preferred to use a colourless, non-fluorescent stamp, which can be made fluorescent on being treated with a reagent.

On occasions, complaints are received from consumers on the quality of a product which the manufacturer suspects, but cannot always prove, may be due to poor storage conditions in the retailer's shop. An invisible stamping on the inside of the carton, which, by its appearance in ultra-violet light, shows whether the carton has been subjected to temperatures or humidities in excess of those desirable for maintenance of good quality of the pack, has been of assistance in such cases.

Check on Pilfering

One trouble that arises from time to time in factories is petty pilfering of such solvents as petrol, oil, and methylated spirits. There have been occasions, however, when the trouble has risen to really serious proportions, taking it right out of the petty pilfering category into that of wholesale theft. In several of such cases, the addition of a small amount of a highly fluorescent, innocuous, and colourless compound to the solvent has allowed the quick and certain identification of samples suspected to have been stolen, since their examination under the lamp has revealed the characteristic fluorescence of the added compound. The substance added, besides being innocuous, must also be entirely foreign in nature, and unlikely to be a natural contaminant. This technique was patented before the war, but the patent has now lapsed.

Tracing Petrol Thieves

When dealing with skilled thieves who may be aware of the possibilities of the fluorescent tracers, a non-fluorescent type may be used which can readily be converted by a simple reaction into a fluorescent compound. A simple illustration of this, but not involving fluorescence, is the colourless tracer added to commercial petrol.

For an ordinary petroleum solvent, such as petrol or benzene, commercial anthracene can be used. A small amount of this tracer is added to the bulk of the solvent, and to test the sample it is spotted on a white filter paper or piece of white cloth and allowed to dry. If the spot is held under the lamp, it appears faint bluish while still wet, but as it dries, a brilliant greenish yellow fluorescence appears progressively from the circumference, and spreads inwards. If it is desired to have the liquid itself fluorescent, quite a number of compounds are available to give this effect. On the other hand, when a colourless non-fluorescent liquid is required a small amount of α-naphthylamine may be added. To detect this addition, the sample is shaken with dilute hydrochloric or sulphuric acid under the lamp, when a brilliant blue fluorescence in the acid layer is obtained. The use to which the solvent is put in the factory governs to a large extent the nature of the added tracer, but the number of substances that can be used allows the selection of one that is suitable in all respects.

Tracers and Liquids

Concerning liquids, the tracers employed are generally those which show a visible fluorescence in solution immediately they are irradiated. For example, the course of water can readily be followed by the intense fluorescence imparted to it by Fluorescein LTS. One of a number of pipes may be cracked, thereby causing flooding or seepage, but the site of the leak may be hidden, either underground or under a floor. To uncover all pipes throughout their length might very well prove costly, especially if the damaged pipe happens to be the last to be uncovered.

By pumping a solution of Fluorescein into one pipe at a time, and watching the flood water, the damaged pipe may be readily revealed by the appearance in the seepage of an intense green fluorescence, which is visible in daylight. If the amount of water passing through the pipes is large, the same procedure of pumping in Fluorescein is carried out, but the seepage water is sampled at frequent intervals thereafter, and the samples examined in a long glass cylinder or tube under the lamp. On looking down the tube, the appearance of a greenish fluorescence is seen when the damaged pipe is treated.

The test is so delicate that one part of Fluorescein in 200 million parts of water can be detected in a one-yard tube. Tests on these lines were applied to the Pluto pipeline during the war to detect leaks which were causing a substantial loss of petrol.

The source of sewage seeping into a pure water supply has also been traced by this method in cases where a factory draws some of its water from wells to supplement that from the mains. The path of neutral or alkaline liquids only can be traced with this substance as it is precipitated in acid waters; with these a basic fluorescent compound should be used, such as β-naphthylamine, and the samples examined in a long tube under the lamp.

Defects in Metals

The intense fluorescence of aqueous solutions of Fluorescein and some other substances under the lamp has been used to detect tiny cracks and pinholes in certain sheet materials and to detect flaws in metal containers. For this

(*Concluded on page* 196)

Maize in History

M. SCHOFIELD, M.A., B.Sc., F.R.I.C.

Among the more striking addresses on food topics presented during 1950, was Dr. R. N. Salaman's Presidential Address to the anthropology section of the British Association. Although he illustrated his thesis on "the influence of food plants on social structure" by reviewing potato history, Dr. Salaman gave one hint regarding subjects for future research in this field. This concerned maize, one of the other "easily grown, cheaply produced foods which might easily depress the standard of life and the social well-being of a community adopting it."

AN interesting analogy between the histories of potato and maize becomes apparent on tracing developments extending from pre-Columbian American civilisations right up to modern industrial applications of starch from the two sources. Dr. Salaman's books have told the classic tale of the potato from at least A.D. 200. Potato history began with Inca civilisations, with Indians making sacrifices to a potato "spirit," with pottery and funeral vases surviving the centuries on pre-Spanish graves on a rainless coast between Peru and North Chile, with vases depicting the first potatoes with prominent eyes and bushy eyebrows. This early *début* proved a remarkable curtain-raiser to a major theme, with *chuño* anticipating dehydrated potatoes by several centuries.

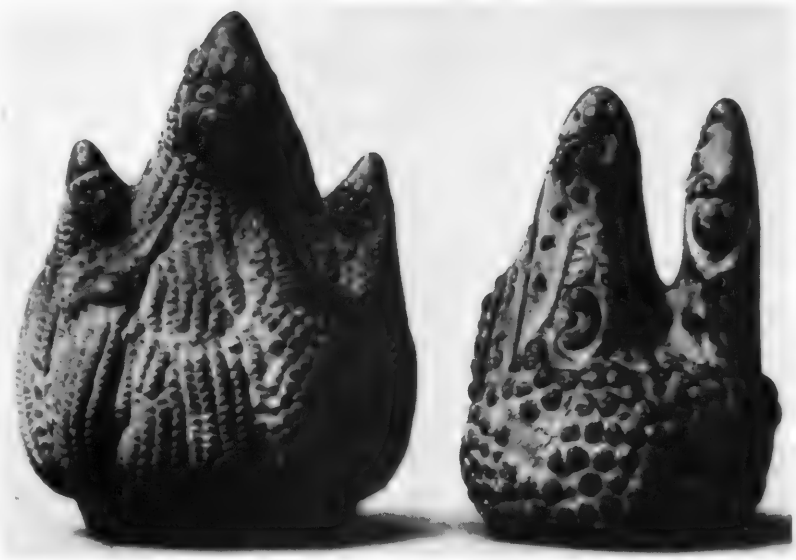
As for maize, the Incas of Peru, with Mayas and Aztecs of Central America, were early in the field with stone sculptures of the maize deity, a god worshipped like the potato spirit, such carvings being common enough among archaeological remnants of middle America. On the prehistoric graves of Peru, Ecuador, and Bolivia, funeral vases and ornaments depicting maize and well-preserved ears of maize provided additional evidence of this early ancestry.

Such a comparison remains close when the introduction of maize into Europe and the Old World is considered, maize being, as with the potato, a link between the western and eastern hemispheres. The evidence that maize was unknown in the Old World, that like the potato or the tobacco plant it spread from west to east by man's agency, is fully established apart from only two discordant notes: the first a report that an ancient Chinese encyclopaedia found in Paris gave an illustration of the maize plant; this has either failed to survive closer scrutiny or has been forgotten. Secondly, Stoner and Anderson in their article "Maize among the Hill Peoples of Assam" (*Annals of the Missouri Botanical Garden*, 1949, **36**, 355-404) describe the maize and maize growing practices of some of the primitive peoples in Asia, and suggest that they may have had maize as a plant before the sixteenth century.

Left: **Mochica vase painted with spiral meanders, and showing fruits, possibly pepper pods.** *Right:* **Mochica vase with stirrup spout, the body encircled with maize cobs in relief, painted red on cream. Both Northern Coast of Peru, c. 1000 A.D.**
Photo British Museum.

The *début* of both potato and maize in Europe provided historians with puzzling points. Drake and Raleigh have been saluted as potato pioneers; but Raleigh's ships never went to Peru, while Drake's statue at Offenbach commemorating "The Introducer of the Potato into Europe in 1580" ignores Pedro Creca and his references in 1553 to *papa* or *battata*. Sir John Hawkins hardly counts, since his discovery referred to the sweet potato.

In contrast, the coming of maize is a simpler problem, with Columbus gaining some credit. The actual day, November 5, 1492, is agreed upon for the opening of the second phase in the history of maize. The two Spani-



Left: **Mochica vase representing the maize demon with attendants.** *Right:* **Mochica vase probably representing male and female spirits of maize. Both Northern Coast of Peru, c. 1000 A.D.**
Photo British Museum.

ards delegated by Columbus to explore deep into Cuba, brought back reports of "a sort of grain they call *maiz*." This was duly sampled, baked, dried, and made into flour of sorts.

As with researches into potato varieties or cultivation when scientific expeditions are ever returning to Peru, the original home of the potato, so with our knowledge of maize acquired from the west. Wherever man gained a foothold in the wilderness, there he planted his potatoes and maize. Those early Indian civilisations not only provided the first colonies with lessons on the use of maize for food, but established the basic essentials, such as the need for crop rotation with beans and squashes, for storing in ventilated cribs, and for removal of hull with lye to form hominy. They passed on into English several Indian names for food preparations from the cereal: names like hominy, samp, and succotash.

A half century after the potato's introduction, John Gerard included it in his Herball. Fifty years after that hard-working "producer" Columbus had given Europe maize, Leonard Fuchs had it in his Herball. Maize from Europe travelled *viâ* the Portuguese into Africa; then through India, Tibet, thence to China, where European travellers soon found an imperial tax imposed on it.

Although definitely of American origin, as De Candolle first maintained, maize is "corn" to the Americans. The general tendency is to regard wheat as the leading crop both in Great Britain and elsewhere. It is a leading world crop, but only takes second place in America, where more than half the world's maize total is grown, with every State and every farm occupied with maize more than with other cereals.

"Field corn," "sweet corn" for canning, and popcorn are other everyday names for types which merely hint at the wide variation in this species. No other plant shows such diversity due to development of new varieties by hybridisation. There is Canadian maize with a 60 day maturing period and Colombian maize taking eleven months for maturing. The maize plant ranges from 2 ft. to more than 20 ft. in height; ears may have from 4 to 36 rows of grain; and it may be grown at sea level, or at over 12,000 ft. up as in the Peruvian Andes.

A clearer picture of maize

American farmer with the type of hybrid maize which added more than 600 million bushels to the U.S. crop in one year.

history began to appear in 1896, when Harshberger showed the close relation of maize to a native Mexican or Guatemalan grass named *teosinte* or *Euchloena mexicana*. Fertile hybrids between this species and maize itself established this point. *Teosinte* and any other species related to maize seemed to be indigenous to Mexico. By 1899, Sturtevant had listed 61 distinct varieties of maize, with 25 of these being sweet corn or *Zea saccharata*, a type well established before this definite recognition since it was introduced 100 years previously into Plymouth, Mass., by the Indians of Susquehanna. "Field corn" in agriculture and "sweet" or "pop" corn in horticulture became a rule in maize growing; but ancient maize does not seem to have been fully fixed by botanists until as late as 1939, when Mangelsdorf and Reeves gave a final verdict that maize first came from a wild corn indigenous to South American lowlands; and that *teosinte* is a more recent result from the natural hybridisation of maize and Tripsacum—this after cultivated maize had been introduced into Central America.

Dr. Salaman's reference to maize as yet another cheap crop with possibly adverse influence on the social well-being of communities may seem rather harsh on a cereal crop with no part of its history comparable to potato famines in Ireland. Yet maize seems at times to have been as much a makeshift as the Irish potato. Indians cultivated maize for bread, as did the early colonists; this despite the heavy crumbly bread which inevitably comes from glutenless maize.

This condemnation applies only when comparisons with wheat are in mind. Maize "mush" or porridge, johnny cakes served with bacon, griddle cakes, and "scrapple" are different, as are young shoots of thickly grown crops served like asparagus and canned maize in the young or "milk" stage. Old maize with its starch could hardly fail to prove a cheap raw material for food and laundering starches, dextrins, and "corn alcohol," part of which may begin the synthesis of artificial rubber. There is corn-syrup, corn-sugar, maize for packing and upholstery, and even the old corncob pipe to prove maize rather more versatile than its close relation, the potato.

Fats and Waxes

IN the latest edition of his book* on the chemistry, composition, and technology of the fats and waxes, Prof. Hilditch has fully maintained the high standard of the earlier ones. He has included the technical developments that have occurred since the second edition of 1941, special attention being paid to the synthetic detergents, the use of solvent segregation and low temperature crystallisation in the large-scale resolution of oils and fats into fractions, and progress in the field of the drying oils.

Of the importance of solvent segregation there can no longer be any doubt. Even now it is finding commercial application at Bromborough Pool for the production of stearine and oleine from distilled bone-fat fatty acids by crystallisation from methanol at about 10° F. No doubt there will be seen in Great Britain the further application of a process similar to that employed in the manufacture of fully drying oils from the semi-drying ones.

Prof. Hilditch has taken great trouble to record all the technological developments of modern times, and he has found some difficulty in compressing the vast amount of information now available into the compass of a compact volume. If it has proved difficult, he must have the reward of knowing that he has succeeded in a manner that merits recognition. Is it too much to hope that in the next edition he will include references to works that are now not mentioned, and especially to some of the books that have appeared in America since the war? —K. A. W.

* *The Industrial Chemistry of Fats and Waxes*. By T. P. Hilditch, D.Sc.(Lond.), F.R.I.C., F.R.S. Third Edition. Pp. xi+604. Baillière, Tindall and Cox, London. Price 27s. 6d.

Milk By-products

DESCRIBING in detail the physical and chemical characteristics of milk, skim milk, whey and buttermilk, and their components, a comprehensive book* gives methods for converting these products of the dairy industry into products for use as food, in foods, and as non-food products.

An outstanding bibliography of references to original articles is presented for those who wish to know the experimental background, theoretical discussions make clear the principles on which manufacturing procedures are based, and flow diagrams give overall pictures of processes.

Basic information on the chemistry and nutritional value of the components of milk, and on behaviour of milk by-products during heating and other processing treatments, and the directions for making such products as fermented milks, whey cheese, condensed and dried whey, ice cream mix, milk sugar, and casein make this book invaluable to manufacturers of dairy products, research workers, and students of dairy science and technology.

* *By-products from Milk*. By Earle O. Whittier and Byron H. Webb. Pp. 317+viii. Reinhold Publishing Corporation, New York; Chapman and Hall, London. Price 48s.

The Use of Fluorescent Tracer Agents

(*Concluded from page* 193)

test the can is sealed with a closure having a tube connected to a vacuum pump, then immersed in a solution of a highly fluorescent compound in water or other suitable mobile liquid and evacuated. Upon breaking the vacuum, opening the container, and examining the inside under ultra-violet light, the appearance of brilliantly fluorescing points and hair lines shows the points of penetration of liquid.

In order to determine whether a batch of material has been properly mixed, it has been found useful to incorporate a small amount of a highly fluorescent product with one of the constituents; the dispersion of this constituent throughout the mix is readily followed by examining samples of the batch under the lamp from time to time.

News from the Industry

FORTHCOMING EVENTS

Agriculture Group

The annual general meeeting of the Agriculture Group of the Society of Chemical Industry will be held at 2.30 p.m. on May 15 in the chemistry department of the Royal College of Science, London, S.W.7.

■

Summer Tour

According to the tentative arrangements for the summer tour of the Food and Agriculture Groups of the Society of Chemical Industry in Northern Italy, the party will leave London by train on the morning of June 1, arriving in Milan the following morning. They will stay in Milan for the period of the tour, returning on the evening of June 9 and arriving in London approximately twenty-four hours later. Arrangements are being made for visits to factories and other establishments of interest in Northern Italy.

■

Nutrition Panel

The annual general meeting of the Nutrition Panel of the Society of Chemical Industry Food Group is to be held at 6 p.m. on May 9 in the Chemical Society's Rooms, Burlington House, Piccadilly, London, W.1. This will be followed at 6.15 p.m. by a scientific meeting, when Dr. W. F. J. Cuthbertson of the Glaxo Laboratories will speak on "Antibiotics and Nutrition."

Visitors wishing to attend this meeting should apply to the secretary of the Panel, Mr. L. C. Dutton, Virol, Ltd., Hanger Lane, Ealing, London, W.5.

■

Sales Management Conference

The Electrical Development Association Sales Management Conference, which will be held from May 22 to 25, will be opened by Mr. H. J. Randall, C.B.E., chairman of the London Electricity Board, and attended by 500 delegates from all parts of the U.K.

The first three days of the Conference will be conducted in the Caxton Hall, Westminster, but the concluding sessions and conference luncheon on May 25 will take place in the Connaught Rooms, Great Queen Street, London.

Among the papers to be read are the following: Electricity and the Food Trade; Co-operation with Allied Professional, Trade, and other Organisations; Lighting Opportunities; More Mechanical Handling as an Aid to Greater Productivity; and Radio Frequency Heating.

Second World Canning Congress, 1951

The Second World Canning Congress, organised by the *Comité International Permanent de la Conserve*, is to take place in Paris from October 16 to 19, 1951. Full details of the programme will be published shortly.

■

Summer Course in Food Science

A summer course in food science will be held in the University of Cambridge, in co-operation with the Department of Scientific and Industrial Research, at the Low Temperature Research Station from August 13 to 28. During the first ten days the course will cover the ground of the previous one held in 1948; recent advances and special topics will be dealt with during the last week.

Provisional registration for the whole course, or for the second part only (which is open to those who have attended the previous course), may now be made in writing to G. F. Hickson, M.A., Secretary, Board of Extra-mural Studies, Stuart House, Cambridge.

■

Society of Dairy Technology

The summer meeting of the Society of Dairy Technology is to be held in Scotland from June 11 to 14 inclusive. All paper-reading sessions and most other functions will be held at the Marine Hotel, Troon.

Tours of the Hannah Dairy Research Institute, Kirkhill, Ayr, a Stranraer creamery, the West of Scotland Agricultural College and gardens at Auchincruive, the Scottish Co-operative Wholesale Society's farm at Monktonhill, and the Graham-Enock Manufacturing Company's works at Portobello have been arranged.

■

The Nutrition Society

At the annual general meeting of the Nutrition Society to be held at the London School of Hygiene on May 26, officers and five Members of Council will be elected.

The Council has nominated Professor S. J. Cowell and Mr. A. L. Bacharach to serve for a final period of one year from May, 1951, as hon. secretary and hon. treasurer respectively.

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Sanderson-Wells Lecture, 1951

"The Chemical Manipulation of Food" is the title of the Sanderson-Wells lecture to be given by Sir Edward Mellanby, C.B.E., K.C.B., F.R.S., M.D., F.R.C.P., F.R.C.S., on May 4 at 4 p.m. in the clinical lecture theatre of the Middlesex Hospital, London, W.1.

Plant Engineers' Conference

The Institution of Incorporated Plant Engineers are holding their fourth annual conference at Buxton from May 22 to 24. With the exception of the civic reception by the Mayor of Buxton, Coun. Arthur Salt, J.P., at the Pavilion Gardens, all functions will take place at the Palace Hotel.

Events include the annual general meeting of the Institution and installation of Mr. D. Lacy-Hulbert as the fifth President, an address by Mr. Oliver Lyle, and the presentation by Mr. Jack E. Duckham of the Alexander Duckham Memorial Awards, followed by a discussion on the winning entries.

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Standardisation on Show

As part of its Golden Jubilee celebrations, an exhibition supported by practically the whole range of British industry will be held at the Science Museum, South Kensington, during the two weeks beginning June 18, 1951, by the British Standards Institution.

The benefits derived from standards, standardisation, and simplification will be graphically presented, and each industry will show how standards have simplified production, reduced costs, and maintained quality, and how in turn they have benefited the users of that industry's products.

The exhibition, which will be opened by the President of the Board of Trade, will also show how research at one end of the production chain and quality control at the other are linked with and helped by standardisation. Other special features will include apparatus used in testing for compliance with British Standards.

Glass Container Problems

The increased demand for glass bottles as an alternative to tinplate and paper containers is already embarrassing bottle makers. Some of the largest packers of national branded goods have placed substantial orders with Scottish firms with a view to switching over to packaging in glass; this trend is expected to develop, and the glass industry will doubtless find difficulty in meeting all requirements.

Some glass container business is carried on with a narrow margin of profit, the business being remunerative only where large quantities are produced. To meet the situation, glass bottle manufacturers are reorganising and developing steadily, and new machinery is being brought into use.

Mechanical handling of ice cream by British Railways.

Ice Cream by Rail

Mechanical handling of ice cream to meet an anticipated 30 per cent. increase in the forwarding by rail of such traffic by Lyons and Co. has been successfully introduced by British Railways, Western Region, at Kensington (Olympia) Station.

In close co-operation with the company, experiments to speed up and simplify the handling of traffic were made, and as an initial step one 4,000 lb. capacity fork lift truck, capable of lifting the loaded stillages from road vehicle to platform level, and two 4,500 lb. capacity electrically operated pedestrian controlled power pallet trucks, for the conveyance of the stillages to the rail vehicles, were provided.

Three wooden stillages, each with twenty-two cases of ice cream, are carried on a road vehicle, and these take three minutes to unload, a speed adequate to maintain a service attuned to the firm's mechanical loading requirements at Cadby Hall.

The scheme is now being extended and will be applied subsequently to the handling of cooked frozen foods and mixed pastries, for which two additional fork lift trucks and five further power pallet trucks have been provided.

Laboratory Chemicals

Recently increased by the addition of twenty-eight chemicals not previously included, the range of some 500 May and Baker laboratory chemicals and reagents continues to find an expanding number of users in industrial, educational, and research laboratories.

Their application to a wide variety of laboratory procedures, including volumetric and gravimetric work and the preparation of bench reagents, has led to wide use in all branches of scientific practice.

Specifications printed on the appropriate label of each container allow rapid assessment of the field of usefulness of the contents, and their presentation in Cellophane-wrapped bottles with bakelite screw-caps gives maximum protection.

"Quosh Quins"

Sandwich-men, dressed as mammoth bottles of fruit squash, represented the "Quosh Quins" from the family of H. W. Carter and Co., specialists in vitamin fruit syrups, at the Ideal Home Exhibition.

The firm recently announced that they were initiating a new marketing policy; this includes a national campaign for their branded products, the "Quosh Quins"—lime juice cordial, lemon barley, grapefruit, and orange and lemon squash.

Bakery Operatives to Compete

To encourage a high standard of production of their type of bread throughout the country, Procea Products are introducing competitions for operatives at exhibitions organised by local bakers' associations and federations.

These competitions will be in addition to those already sponsored by the company for master bakers.

Mix + Water = Cake

At a recent conference there was demonstrated a new prepared flour for making cakes in loaf, sandwich, or cup form, the only additive required being water.

Available in six flavours, angel, orange, afternoon tea, chocolate, ginger, and sponge pudding, Readi cake mix is being distributed throughout the British Isles by Armour and Co.

Eliminating Food Pests

Wherever food is stored there is a danger of infestation by rats and mice. It is impossible to make a permanent clearance of these pests; one or two may get into the warehouse or factory, and by the time they are noticed, a colony will already have been established. In order to clear premises of rats and mice it is advisable to use a medium, such as Ratin, which will not arouse their suspicions and make them refuse bait. Those rats which escape are "mopped up" by using the supplementary preparation, Ratinin. Both these preparations are harmless to domestic animals.

Having effected the initial clearance, the Ratin Service then keeps control by regular inspections and appropriate action as soon as newcomers are found on the premises. Over 50,000 contracts have been handled successfully in the past quarter of a century by the forty-four Ratin centres that cover Great Britain.

The "Quosh Quins" go for a stroll to advertise the fruit squash products of H. W. Carter and Co.

Scottish Raspberry Research

On April 1 the Scottish raspberry investigation, initiated and directed by East Malling Research Station, was transferred to the newly created Scottish Horticultural Research Institute at Mylnefield, Invergowrie.

Dr. T. Swarbrick, first director of the Research Institute, is well known to commercial fruit-growing circles for his work at Long Ashton, where he was successively plant physiologist and pomologist for almost twenty years.

Tinplate for Scots Factories

Supplies of tinplate to the food canning factories in the north-east of Scotland are to be increased as a result of the debate in the House of Commons at the end of February. Crosse and Blackwell have been granted a building licence by the Ministry of Works to extend their Peterhead factory by 17,500 sq. ft. so that they can produce more food and keep their workers employed all the year round. Representations on the firm's behalf were made to the Minister of Food by Mr. Robert Boothby, M.P.

It is proposed to have the extension ready in time for the herring landings, and full use is to be made of local labour in the building of it.

New Cereal Food Pack

An attractively designed carton, which is essentially modern in appearance and possesses several new ideas yet retains a familiarity (chiefly by its colour scheme) with the old design, is replacing the existing Farex pack.

One feature of the new pack is its dual display value, one side emphasising the product as a baby food, and the other its use as an invalid and family cereal. Effective use is made of the top flap for advertising slogans; the cartons are printed six at a time and carry as many different slogans. Practical use has been made of the inside flaps, and there is an instructive diagram on the growth of babies' teeth.

One of the greatest improvements to the construction of the pack is the incorporation of a tuck-in lid which enables the carton to be reclosed after use, and helps to ensure that the product is kept fresh. The Farex itself is enclosed in a heat-sealed bag, and the inner flaps of the carton are gum-sealed under the lid. Laboratory tests, in open and special conditions, have shown that there is no seepage from this new type of pack.

The surface design of the new carton was by Mr. A. E. Fisher, head artist, and the constructional design by Mr. J. L. Winfield, packaging manager, both of the Publicity Services Group of Glaxo Laboratories.

Appointments

Mr. J. W. Watkins, D.S.O., M.C., operating superintendent of the London Midland Region, has been appointed chief regional officer, London Midland Region, by the Railway Executive, with the concurrence of the British Transport Commission. He succeeds Mr. John Elliot, who was recently appointed chairman of the Railway Executive.

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Mr. G. Sewell, A.M.I.Mech.E., chief mechanical engineer, has been appointed to the board of directors of Hopkinsons.

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Mr. F. A. Shepherd has taken over representation of The Automatic Weighing and Packing Machine Co. in the London area and South-Eastern Counties. He succeeds Mr. H. B. Norris, who is now established in Vancouver, B.C.

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Mr. R. E. Dymond has been appointed technical director to Electropower Gears and is responsible for design and development.

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Mr. E. R. A. Milne.

Mr. E. R. A. Milne, A.M.I.E.E., formerly an assistant sales engineer in the Manchester area, has been promoted branch manager for Scotland at their Glasgow office, in charge of electric motor sales, by Newman Industries.

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Mr. A. H. Bingley has been appointed factory representative for J. H. Fenner and Co. in the Union of South Africa as from March 1, 1951. He will advise on mechanical power transmission from the address of the company's agents, Reunert and Lenz, Ltd., P.O. Box 92, 86, Main Street, Johannesburg. (Telephone: 33-5207.)

Refrigeration Fair

Actual demonstrations of quick freezing of poultry and farm produce, ice cream manufacture, and hygienic food packing by modern methods were given at a recent trade exhibition at Maidstone organised by Kent Kold.

More than fifty different types of refrigerator were displayed and The Oppenheimer Casing Co. (U.K.) showed their Hypak heat sealer for small scale work, and a vulcanised insulated fibreboard container of 2·3 cu. ft. capacity, in which dry ice is used as a medium, for the despatch of frozen food.

S.P.A. Microchemistry Group

At the seventh annual general meeting of the Microchemistry Group of the Society of Public Analysts and Other Analytical Chemists held recently at the Sir John Cass College, London, E.C.3, the following officers and committee members were elected for the ensuing year:

Chairman: Dr. C. L. Wilson.
Vice-chairman: Dr. A. M. Ward.
Hon. secretary: Mr. D. F. Phillips.
Hon. treasurer: Mr. G. Ingram.
Elected committee members: Dr. W. T. Chambers, Dr. J. G. A. Griffiths, Dr. G. F. Hodsman, Mr. R. F Milton, Mr. G. H. Osborn, and Dr. J. Sandilands.

Retirements

Mr. E. A. Wrottesley retired from the board of Huntley and Palmers on March 31. He commenced his career as an office boy in the London office of the firm in 1889, and shortly afterwards was appointed buying clerk.

In 1903 he was transferred to headquarters at Reading as apprentice to all departments, and later was appointed manager of "B" manufacturing, then assistant buyer and manager of the stores department. He became chief buyer in 1908, and chief works manager in 1928, being elected to the board of directors in 1931. He is also a member of the board of the Associated Biscuit Manufacturers.

Mr. Wrottesley was presented with a Broadwood grand piano by the directors in February, 1949, on the completion of his fifty years' service.

The company also presented a silver salver to Mr. Walter F. Cottrell in recognition of his fifty years' service with the company.

Mr. Cottrell is an administrative executive of the company, which he joined in 1901. He commenced duties in the country ledger office, and from there he transferred to the correspondence office, which later became absorbed in the home trade department.

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Mr. Elliot B. Dewberry, M.B.E., F.R.San.I., F.R.I.P.H.H., F.R.Ent.S., retired from the post of chief hygiene officer at the Ministry of Works on March 31.

Mr. Dewberry has been for some years a valued contributor to FOOD MANUFACTURE.

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Mr. J. A. S. Morrison, M.Sc., F.R.I.C., who joined the Printing, Packaging, and Allied Trades Research Association as their first liaison officer in 1939 and has been senior liaison officer since 1945, was entertained at a luncheon recently during which he was presented with a radiogram by the Council of the Association to mark his retirement.

Works Advisory Panels

The West Midland branch of The Institution of Works Managers has recently set up two panels, each consisting of five members, for the purpose of assisting its 250 members in securing information. One panel will deal with enquiries on incentives, the other with questions on simplification and time and motion study.

Many of the members of the branch are in charge of the whole or part of the foremost industries in the Midlands, and are experts in the manufacturing techniques used in their industries. These panels, therefore, will make a big contribution towards increasing the serviceability of the branch to its members.

U.S. Buys Ice Cream Machine

The U.S. patent rights of a new Wall's ice cream machine for producing individual portions of wrapped ice cream have been bought by Hood's of Boston, Massachusetts, one of the largest ice cream firms in New England.

Brickettes are delivered at a rate of 200 a minute by a moving nozzle. On an ammonia-cooled belt they pass through a blast tunnel from which they are taken by conveyor to wrapping and bundling machines.

Gelatine and Glue Research

The annual general meeting of the British Gelatine and Glue Research Association was held recently at the Waldorf Hotel, Aldwych, London, W.C.1, with Mr. S. G. Hudson in the chair.

In presenting the Council's report, Mr. A. G. Ward, director, said that whereas last year he had been forced to confine himself to a description of plans for the future, this year he had more real progress to report. The Association had obtained possession of its laboratories at 2/4, Dalmeny Avenue, Holloway, N.7, in August, and the modifications to the premises, which had included the provision of new services, were now virtually complete. The equipping of the premises had proceeded as fast as the supply position permitted, and despite the shortage of chemists all the staff originally planned for had been obtained.

Every effort was being made to create an atmosphere conducive to vigorous and progressive research. Relations with the industry were being built up in a satisfactory manner, the Research Panel meetings proving the most fruitful source of contact.

Mr. G. W. Odey, C.B.E., M.P., was re-elected President of the Association. The report, together with the statement of accounts, were adopted unanimously.

Team Study U.S. Packet Foods

Another Productivity Team recently made a six weeks' tour in the U.S.A. to study American practice in packet foods (groceries), under the aegis of the Anglo-American Council on Productivity, with the assistance of the E.C.A. Technical Assistance Division.

Mr. F. Monkhouse.

The team, led by Mr. F. Monkhouse, chairman and managing director of Monkhouse and Glasscock, consisted of sixteen members drawn from all levels in the industry—management, supervisory, and operative, and included specialists in the fields of technical processing, chemistry, accountancy, and distribution, nominated from the staffs of representative British firms manufacturing all packet grocery foods. Mr. F. J. Lawton of the Food Manufacturers' Federation Inc. acted as secretary.

The problems and methods with which they were concerned covered supply and selection of raw materials, processing, packaging, machinery and equipment, research and quality control, the chain of distribution, management, and industrial relations.

Bacon-pig Carcass Competition

In view of the Ministry of Food's intention to reintroduce grading of bacon-pig carcasses, a bacon-pig carcass competition, organised by the Middlesex County Pigs Branch, National Farmers' Union, in conjunction with T. Wall and Sons, was held recently at the firm's Willesden bacon factory. Twenty-six pigs were entered and more than 250 Home Counties farmers and representatives of the distributive trade attended.

Mr. F. R. Scott, Deputy President of the Union, who presented the prizes, said it was more than ever essential for pig breeders to produce as much as possible of their feeding-stuffs from their own soil. Supplies from the Iron Curtain countries were diminishing and would continue to do so. For currency reasons, Britain was unlikely to get increased supplies of bacon from Canada in the immediate future, and the public would, therefore, look to the British farmer for any increase in bacon supplies.

Mr. Jack Morris, chairman of the Middlesex County Pigs Branch, remarked upon the fact that all entries in the competition had come from commercial herds. No special attention had been given to any of the pigs and he thought that the quality of the bacon on display was exceptionally high.

Stressing the importance of improving the quality of British bacon so that it might compete more successfully with Danish and other imported sides, Mr. C. E. B. Brett, the company's bacon production manager, urged British breeders and curers to co-operate with the distributive trade, so that consumers may be provided with bacon with a high proportion of lean meat.

Sulphuric Acid Plant Project

Plans for the new sulphuric acid manufacturing plant which Scottish Agricultural Industries are to erect at Sandilands Chemical Works, Aberdeen, at a cost of more than £400,000 were recently approved by Aberdeen Corporation Plans and Town Planning Committee.

The new plant will produce 37,000 tons of concentrated sulphuric acid a year and will be in full production in about two years' time. It will be able to make sufficient acid for all the superphosphate—a basic component of fertilisers—required by the agricultural industry in the north and north-east of Scotland.

The installation will consist of a combination of a flash roasting pyrites furnace which, it is claimed, will be the largest in the world, and a Petersen tower plant, the first to be erected in Great Britain. Brick walls of the six towers, which will comprise part of the installation, will be packed with 2,000 tons of Corrennie granite produced at Tillyfourie, Aberdeenshire. This type of granite has been found to react most successfully in acid-resisting tests, and it will be the first time that granite has been used for such a purpose.

Powdered Essences

Specially created for this type of food manufacture, Polvaromas, powdered essences and flavours manufactured by Polak and Schwarz, are claimed to have considerable advantages over the liquid-types in the preparation of such products as jelly crystals.

OBITUARY

Major Denis J. Burke, O.B.E., at his London home on March 8, aged 64. He was educated at Beaumont, and, after passing through Sandhurst, was commissioned in the Worcester Regiment in 1905. In 1917 he received the Royal Humane Society's medal for saving life, and was awarded the O.B.E. in 1919.

On demobilisation in 1920 he became interested in the chemical industry. He joined the American company, Commercial Solvents Corporation, in 1927, and was a member of their British organisation until they formed Commercial Solvents (G.B.) to operate their processes in England, when Major Burke became managing director, an office which he filled until his death. In 1937, this company became associated with The Distillers Company, and from 1943 to 1945 he undertook the reorganisation of the research and development department of the D.C.L. Towards the end of 1945 he was asked to organise the production operations of the penicillin factory at Speke, Liverpool, which, in conjunction with his old company, Commercial Solvents Corporation (U.S.A.), the D.C.L. built and operated as agents for the Minister of Supply.

In December, 1947, Major Burke became deputy chairman of The Distillers Company (Biochemicals), and he held this office until his death.

In addition to these duties, Major Burke was chairman of Charles Moore and Company (salt manufacturers), of The Emido Company, and of The Liverpool Adhesive Paste Company. He was a director of British Industrial Solvents, The Methylating Company, and The Industrial Spirit Company.

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Mr. S. H. Doddrell on March 15 at "The Rising Sun," Willesden Green, London, N.W., of which he had been licensee for nearly four years.

For forty-one years Mr. Doddrell was associated with Negretti and Zambra, having held the position of publicity manager and advertising director for a long period until he retired in 1947.

*

Mr. G. F. W. Grainger, vice-chairman of T. and T. Vicars, at his home in Worthing, Sussex, on January 25 at the age of 80.

Mr. Grainger, who had been with the firm for 64 years, had travelled extensively in many parts of the world, and was well known throughout the biscuit industry. He was chairman of the Biscuit Section of the Food Machinery Association of Britain.

*

Mr. E. A. Fuller, chairman and managing director of The English Grains Company, on March 18 at the age of 79.

Bedford-Scammell insulated meat container made by Vauxhall Motors. Quarters are suspended on a mono-rail fixed to the specially reinforced roof.

Powdered Caramel

Caramel in powder form, of high colour value (48,000 Lovibond), free-flowing, non-hygroscopic, and easily incorporated into powdered food such as gravy products, and pudding and cake mixtures, has been produced as a result of recent research in the laboratories of George Clark and Son.

Caramel has advantages over synthetic brown dyes in that its colour is stable to heat and light, it gives a uniform brown colour on wetting and does not show multi-coloured specks as does a synthetic dye mixture, and it is regarded as a "natural colouring."

Tubular Steel Shelving

Providing an efficient and quick method of building tubular steel structures required in industry, or by Public Authorities and Service Departments, Kee Klamps permit the full use of a tube with a constant strength in every direction so that all structures can be completed at economical cost. The construction is fire-proof, clean, simple to erect, and durable.

Shelving, solid but light, can be added by means of boards which require no nuts, bolts, or clips.

An innovation specially designed by the Geo. H. Gascoigne Co. for the food manufacturer is their flow stock racks. This system enables goods placed in the storage rack to gravitate through to the packing department, thus obviating the necessity for storing articles and the individual selection of same for transportation for packing. Manhandling costs are eliminated and all goods may be despatched in proper rotation.

Personalia

Mr. A. G. H. Barnes, representative for W. J. Bush and Co., who specialises in the ice cream trade in the London and Middlesex area, has been called up for service with the R.A.F.V.R. until mid-July.

Haggis for the Hungry

The shortage of meat has led to a growing demand for haggis, and thousands are being sent monthly to England. Some English stores report that sales have jumped to four or five times the normal figure.

To ensure that this Scottish delicacy is appreciated, recipes are supplied with each haggis.

Royal Society Elections

Among those recently elected into the Fellowship of The Royal Society are: Albert Neuberger, biochemist of the National Institute for Medical Research, for his researches into the biochemistry of amino acids and proteins; Leonard B. Pfeil, director of research, Mond Nickel Co., for his contributions to metallurgical research on ferrous and non-ferrous metals; and Petrus J. du Toit, President of the South African Council for Scientific and Industrial Research, for his contributions to the study of the diseases of animals, especially of domestic cattle, and particularly those due to soil deficiencies and to infections transmitted by ticks.

Transport Association's Progress

The total of new members in the area for the year was 429—a record number—representing a vehicle strength of more than 4,700, it is announced in a report by the London and Home Counties area of the Traders' Road Transport Association, national organisation for "C" licence-holders, on membership recruitment during 1950.

Three new sections were established last year at Bournemouth, Portsmouth, and Southampton. Thirteen open meetings were held in various towns in the area during the twelve months under review, and Mr. R. E. G. Brown, area secretary, addressed a number of meetings of local chambers of commerce and trade associations.

Three Millionth Motor

Alderman Joseph Howat, Mayor of Coventry, visited the BTH Coventry works during the final assembly, testing, and packing of the three-millionth F.H.P. motor to come off the production line. This motor was for export, being one of a batch of 5,000 quarter-horsepower, 110 volt, 60 cycle, single-phase induction motors, on a repeat order recently received from the Canadian General Electric Company.

Production of fractional horsepower motors started in 1919, and for five years afterwards was confined to spinning motors. In 1924 it was decided to produce standard lines for general industrial applications. By 1930 the output was 30,000 motors a year, and this figure had risen in 1939 to 100,000 a year. Since the war there had been a considerable increase in the demand—the 1946 output doubled that of 1945 and the production curve was still rising steeply. This demand was anticipated by the company in bringing into operation two other factories.

Lipase-free Oatmeal

As oatmeal and flakes leave the mill, they are usually in a palatable condition, but although millers are justifiably proud of their particular brand, they find that the shelf life and the quality of the products manufactured from their oatmeal leave much to be desired.

Investigation has shown that the most serious deterioration is caused by the action of the enzyme lipase on the fat contained in the oat product. This action results in the production of free fatty acid and glycerol. In the unmilled oat, the enzyme appears to exist in a "bound" condition, but in the process of milling, particularly in the kilning, where conditions of temperature are favourable, the enzyme is set free.

Having established the cause of the trouble, P. Lea, of Morning Foods, and J. Cassidy, A.R.I.C., chief chemist of Minsal, decided to investigate the degree to which the deterioration developed in the various products. A range of samples of the various oat products were submitted to tests, involving normal storage conditions, and also conditions designed to produce the maximum deterioration. It was found that certain grades showed a much more serious degree of deterioration than others.

From their observations it appeared that heating destroyed the enzyme lipase, and the next step was to establish conditions which accelerated the enzymic activity which is the cause of unpleasant flavours. It was found that temperature, coupled with moisture, provided conditions for rapid deterioration.

The activation of the lipase having been started in the kiln, the subsequent destruction of the enzyme later on in the process does not result in removing the bitter taste which has already formed, and the meals produced would also have a high free fatty acid content.

It was established that meals which possess the enzyme in active form, and which are stored in cool conditions allowing little moisture to be absorbed from the air, remain in good condition.

Unfortunately when these goods were used in the manufacture of biscuits and similar goods, the lipase acted on the fats which were present in the dough. Some produced a distinct soapiness, especially in the case of coconut and palm kernel oil (even where no bicarbonate was used), whereas others, particularly the oat fat, produced an objectionable bitterness.

The conditions necessary for destroying the enzymes could not be satisfactorily produced during the kilning process, because a temperature of 180° C. had to be maintained, which was difficult to do on a commercial basis.

After much experimentation, an effective method of control was adopted, which enabled the manufacture of lipase-free oat products, thus opening an entirely new field for their use.

Oxidative rancidity presents a further problem. In this, the oat fat slowly absorbs oxygen from the air, producing a sweet, sickly rancidity, normally associated with fatty foods. This is in sharp contrast to the bitterness produced by lipase activity. Although in old samples of meal both types exist and there is no apparent relationship between the two, the fact remains that lipase-free meals keep much better. Further, the prevention of oxidative rancidity is primarily one of storage, and consequently is more easily controlled than the other.

As a direct result of these developments users of oatmeal can now obtain oat products which are free from lipase and from obnoxious impurities.

Co-operative Bakery Costings

Because medium-sized and small Co-operative Societies were failing to submit costings of their bakery departments, the bread subsidy paid to Scottish bakers was less than it might be, it was stated during the discussion which followed an address by Mr. Hugh W. Harvey, J.P., on "Costings" at the recent annual general meeting of the Scottish Co-operative Baking Trade Association.

It was suggested that the present bakery costing figures were lopsided because these were being submitted to the Government by only six of the large mechanised Co-operative bakeries in Scotland.

Employees Discuss New Factory

All their employees were recently given the opportunity of having a say in the layout and organisation of a new factory which is shortly to be built by The A.P.V. Company. The present four factories will be moved into an entirely new one in the Crawley New Town, and all employees who are able to make the move will go, houses being provided for them at Crawley.

The meeting was held in the form of a Brains Trust with the managing director, Mr. P. W. Seligman, as Question Master and the various executives responsible for the planning of the new factory forming the Brains Trust. The questions, most of which took the form of suggestions, were well informed and constructive and showed the active interest taken by the employees in the affairs of the company.

Full-fat Soya Flour

With its approximate 20 per cent. fat and 40 per cent. protein content, and its ease of incorporation in all food mixes, soya flour proves a valuable ingredient in bakery, confectionery, and many other food products. It is particularly useful for inclusion in the general dietary, where it is essential to secure proper nutrition with adequate protein standard.

Packed in special multi-ply ½ cwt. paper bags, Soyolk full-fat processed soya flour is now available at a reduced price which became operative immediately the Ministry of Food released the industry from control. Soya Foods, pioneers of the industry in the United Kingdom, are also offering the product prepacked in 1 lb. printed bags ready for distribution. A leaflet is provided to guide the consumer in securing proper protein intake.

Transfer of Information Unit

The Technical Information and Documents Unit (T.I.D.U.), which for a number of years has been attached to the Board of Trade, became part of the information services of the Department of Scientific and Industrial Research on April 1. For the present, the Unit remains at Lacon House, Theobalds Road, London, W.C.1, where it will continue to hold at the disposal of industry its large collection of unpublished documents. Interest in these has recently revived on account of the valuable information they contain on the production and use of substitute materials.

A small technical section is available to assist with the selection of material to meet specific needs, and a reading room is provided for those wishing to make a detailed study of drawings and documents. Alternatively photocopies can be supplied at moderate charges.

Advances in Food Manufacturing Equipment at the B.I.F.

BIRMINGHAM

Pumps and Valves

Among the exhibits on stand D.716 are the H type stainless steel, self-priming, positive rotary pumps, specially produced for handling highly viscous and pulped food products by Mono Pumps.

The self-priming feature and the ability of the Mono pumps to handle thick viscous fluids are amply demonstrated by a D.4 model which is pumping lime sludge on the stand. The Kwikleen pump, shown handling a food product, is particularly suitable for duties where a high degree of hygiene is required, as all parts in contact with the liquid are of stainless steel and the pump is quickly dismantled for cleaning.

The smooth, even flow achieved by the company's pumps is demonstrated by their 50 g.p.h. 1BD15 model for pharmaceutical and laboratory use which is seen circulating paraffin emulsion, and a physical explanation of the principle of operation is provided by various working models.

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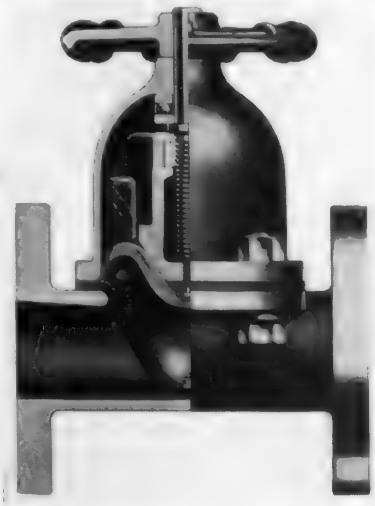
The range of valves exhibited on stand D.129 is representative of types, sizes, and methods of operation of the complete series made by the Saunders Valve Company. Sectional models explain their simplicity, sureness of closure, and the advantages of isolated mechanism, and working models show various methods of hand and power operation.

Pressure operation is demonstrated by both piston and air motor models. Their adaptability to remote and automatic control is seen, and a complete display unit, with electrically operated trip switches, indicates the possibilities of the system for process and similar plant. The K diaphragm valve range, with straight-through full-bore passage permitting rodding-through for removal of obstructions, has been increased, and for the smaller pipelines diaphragm control is now available.

Examples of the three basic types of the Safran centrifugal pump, self-contained, direct coupled, and with independent drive, are exhibited. All three forms of the self-contained unit are on view.



K type diaphragm valve.
Saunders Valve Company.

Grinding Machines

There is a machine in their range of breaking, crushing, pulverising, and grinding machines for friable materials to suit product requirements between 8 in. cubes and 300 B.S. mesh, and British Jeffrey-Diamond, who are exhibiting on stand D.526, are showing a selection representative of the scope of these machines. Capacities vary from a few hundredweights to hundreds of tons per hour, depending on the material handled and product required, and all machines are capable of producing the required article in one pass through the machine. Several machines can be adapted for shredding fibrous materials.

The models displayed include flextooth and rigid hammer crushers, a swing hammer pulveriser, the Atomill fine grinder, and the Microid Atomill, which, although designed principally for laboratory work, is robust enough for small batch production.

*

Pulverisers and atomisers for grinding, wet milling, and granulating of a wide range of food products and chemicals are shown by Bramigk and Co. on stand C.315. The dustless pulveriser, which is made in five sizes with capacities ranging from 5 to 30,000 lb. per hour, depending on material and mesh fineness, is capable of disintegrating, granulating, or wet and dry grinding to 300 mesh. Developed to produce finer powders is the atomiser—a new mechanical, screenless pulveriser for ultra-fine grinding in the 1 to 25 micron range which is available in three sizes for pilot plant or large scale production.

Another item of Mikro equipment on view is a collector which ensures 100 per cent. recovery of solids.

Floors and Linings

The flooring of the exhibit on stand D.433 is divided up into numerous sections showing actual floor surfaces of various kinds such as acid-resisting brickwork and paving, hard-wearing granolithic decorative tiles, industrial Ferrogran steel-faced flags in two colours, Consol steel Anchor floor plates, and cast iron grids. In addition, a section of the stand is laid with Accotile decorative flooring. Samples of decorative tiles, a complete range of acid-resisting cements, various plastic fabrications and plastic linings, and Prodorglaze wall surface finishes are also being shown by Prodorite.

Models of tank sections show various methods of construction and one of a portion of a strip pickling plant shows full details of construction and method of operation.

Iron and Steel Products

An evaporator fabricated from stabilised stainless steel to the design of Bennett Sons and Shears for experimental purposes in the production of evaporated milk is one of the exhibits of Thompson Bros. (Bilston) on stand D.635. A process vessel of stainless clad steel with sections cut away to show the fusion welding of the various types of joints, a hemispherical steam jacketed pan of 150 gallons capacity, a section of a stainless steel milk storage tank, a mild steel pan lined with pigmented phenolic lacquer, and a heating coil for a vacuum pan are other items of equipment for the food and allied industries.

The galvanising plant section is represented by a centre drive centrifugal machine for use with hot dip galvanising, a pump for the quick removal of hot fluid spelter from a galvanising bath, and a true-to-scale model of a galvanising plant of thermostatically controlled type, complete with pickling plant, drying stoves, and mechanical handling equipment.

Centre drive centrifugal machine for use with hot dip galvanising.
Thompson Bros. (Bilston).

The accent, on stand D.519, is almost entirely on Silver Fox stainless steel, a product of Samuel Fox and Co., an associate company of The United Steel Companies. Under the general description of "stainless steel" are available a whole range of alloys designed to resist varying types of corrosion, and differing completely in composition, treatment, and properties. The display demonstrates the versatility of these steels and the wide variety of their applications.

Although the full range of iron and steel products of the various branches of the companies cannot be included, full information in regard to them is available.

*

Samples of the stainless steel products of The Taylor Rustless Fittings Co. include "Pland" sink units, architectural fittings and door furniture, and holloware. Stainless steel chemical plant for the food and chemical industries, dyeworks, and other applications, and shop fittings, with butchers' fittings a speciality, are on view on stand B.504.

The company now have agents in Montreal, Winnipeg, and Vancouver, and have tooled up specially for the North American market.

*

Constructed of Bar-form metal partitions, stand B.517/416 comprises examples of plate and sheet metal work, a special display of perforated metals, and steel drums for the oil, paint, and chemical industries. Nested galvanised steel cisterns, other types of cisterns, cylinders and hot water tanks, ice moulds, and an industrial steel sink are also exhibits of Fredk. Braby and Co., and their subsidary company, the G.C. Engineering Co., are contributing a working exhibit in the form of a steriliser for the food industry.

A mild steel vacuum vessel (4 ft. 11½ in. inside diameter by 4 ft. 11½ in. deep), a 25 gallon stainless steel steam jacketed hemispherical bottom pan, and a 100 gallon model of this pan with portable mixer are among the main exhibits on stand D.244. A vertical pressure vessel with quick-fastening door and three models of a mild steel air receiver are also being shown by Robert Jenkins and Co., as well as a set of galvanised nested cisterns, steel hot water boilers, steel gilled tubes, and a model of a petrol tank installation.

Automatic Can Machinery

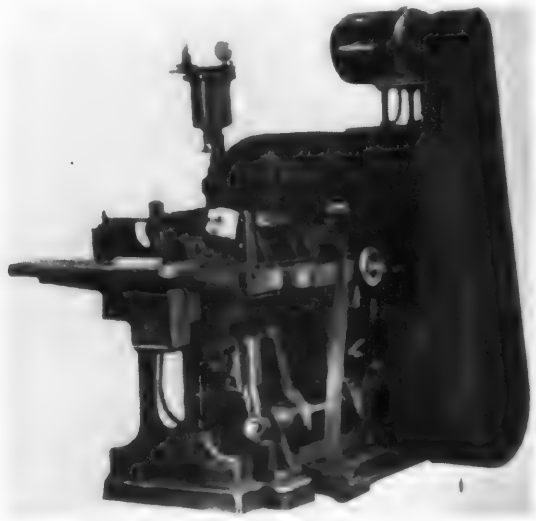
A convenient means of coding the bottoms and lids of tin cans is provided by the can-embossing machine being shown by Funditor, who are exhibiting on stand F.34 at Olympia and D.324 at Castle Bromwich. Codes can be set up from interchangeable type and locked in the special holder, and a special retractable embossing anvil enables tins of different diameters and heights to be handled. Marking machines for use on plastics, wood, metals, glass, ceramics, carbide, and other materials, are to be seen, as well as a Supersaw for cutting rods, extruded sections, and plastic sheets to accurate lengths. The company are also showing electric ovens for industrial treatments such as preheating, curing, core-drying, lacquering, and other drying processes requiring relatively low temperatures; these have automatic temperature control.

*

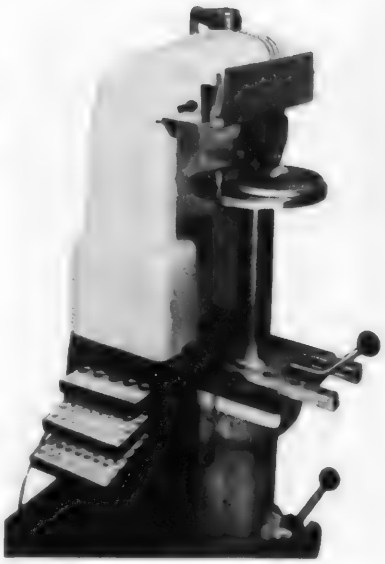
Capable of producing cans from 2 in. to 4¼ in. in diameter and from 2 in. to 5 5/16 in. in height, the automatic can body maker on view on stand D.603 has an output up to a maximum of 150 per minute. Similar machines are manufactured by E. W. Bliss (England) for the production of miscellaneous round, square, and irregular shaped can bodies. Blanks are fed into the machine by automatic horizontal suction feeds, and the lock seam is made and bumped at the bottom of the horn in order that a roll soldering attachment may be used.

Another interesting exhibit is the gang slitting machine, designed to slit tinplate sheets up to a maximum thickness of 0·023 in. in strips, and commonly used for cutting the standard range of blanks for sanitary food cans or dry pack cans. It may also be used for precision cutting of lithographed tinplate sheets and, where necessary, for trimming the edges only.

High production and inclinable and bench power presses are also on view.



Can body maker.
E. W. Bliss (England).

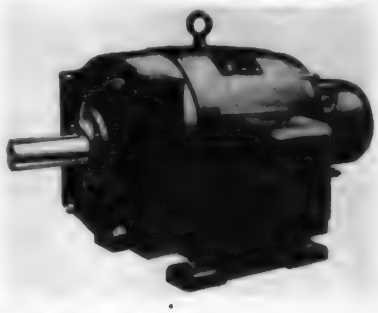


Can-embossing machine operating on a can lid. *Funditor.*

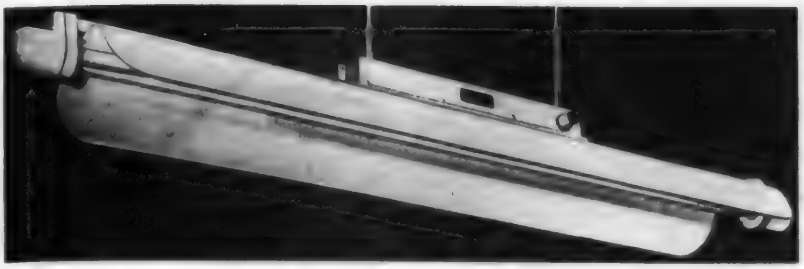
Motors and Electrical Equipment

Of particular interest on stand C.518 are examples of the latest addition to the range of industrial type motors made by Newman Industries. These new motors have outputs from 20 h.p. to 200 h.p. and are made as slip ring or squirrel cage induction types; they are supplied with either foot, flange, or skirt mountings, and can be either screen protected, drip-proof, or totally enclosed. With the exception of the largest frame sizes, all motors comply with N.E.M.A. dimensions.

Barrel type flameproof, standard flameproof, standard industrial, loom, and fractional horsepower types are among the forty-five motors shown. Two sectioned working models show the application of a Newman motor driving a gear unit, and there is a working model of the Elf fractional motor.



Large industrial motor.
Newman Industries.



Vapour-proof fluorescent lighting fitting. *Crompton Parkinson.*

Medium and small types from their range of electrical machines and various types of switchgear may be seen on stand C.609, where Crompton Parkinson are exhibiting. Among items shown for the first time are the Magnicon alternator and CLA switchgear for ratings up to 11 kV., 600 amp. normal current, 250 MVA breaking capacity. A range of 4 in. and 6 in. dial instruments for switchboards, portable instruments and meters, rubber and paper insulated cables, and stud welding equipment is on view, and the selection of fluorescent, tungsten, mercury vapour, sodium discharge lamps, and lighting fittings includes Crompton-Louvalite, a recent development for interior lighting, and vapour-proof fluorescent lighting fittings. Traction, commercial, and car starter batteries complete the display.

■

In addition to four scale models of large electrical equipment, the exhibits of Metropolitan-Vickers Electrical Co. on stand C.510 include an inexpensive hydraulic servo equipment which enables most shapes to be machined quickly and accurately to the profile of a master template or sample workpiece. Two arrangements of standard motor and control gear are demonstrated, one of which consists of a four-panel contactor starter switchboard for the direct-on starting of A.C. squirrel cage motors, and a demonstration unit illustrating sequence interlocking control applied to four conveyors. Each panel of the switchboard controls one panel; the conveyor movement, the motor rotation, and the material flow situation are shown by means of animated lights. Precision castings made by the company are included in the display.

■

A top stator portion of a 1,825 kW. alternator, with a wooden frame accommodating various A.C. motors, shows the extent of the range of rotating machines made by The Electric Construction Company. Two larger motors, one squirrel cage and the other slip ring type, are also shown. A 500 amp. plating rectifier is provided with a window in the side of the tank so that plates can be viewed, and a similar arrangement is made in the case of the Varispeed equipment exhibited. Two electronic control units, two drawout type circuit-breaker units, indicating instruments including a contact voltmeter, and a push-button contactor starter can also be seen on stand C.708 in addition to a model substation with H.T. switch, transformer, rectifier, and M.G. set.

■

Against a background of heavy electrical plant, augmented by dioramas, photographic displays, and a scale model of a hydro-electric station, a comprehensive selection of British Thomson-Houston products are demonstrated on stand C.511/410.

These exhibits include industrial switchgear, a three-phase high-voltage contactor unit, and electric motors from fractional horsepower sizes up to 50 h.p. A new line of type KN industrial electric motors is being introduced; these are totally enclosed squirrel cage induction machines built to the new British Standards with regard to fixing dimensions, etc.

Clearcall industrial communication equipment, industrial electrical control gear and heaters, and the latest developments in Mazda lamps and lighting equipment are displayed. Many exhibits are shown operating, and a halogen vapour leak detector, a gaussmeter for determining the strength of magnetic fields in small air gaps, and a fluorescent lamp and circuit component tester are also available for demonstration.

■

Among the range of electrode steam and hot water boilers on stand C.712 is a 70 kW. steam boiler working in conjunction with a 30 gallon jacketed boiling pan to demonstrate a new type of pressure control. The pressure modulator is sensitive to slight variations of steam pressure, and as this increases, owing to the steam demand having lessened, the modulator automatically reduces the electrical input. Similarly, if the pressure tends to fall, the modulator will increase the electrical load.

Two other new features which Bastian and Allen are producing for the first time in Great Britain are the "vapour phase" system of cooling for Diesel engines which increases efficiency and minimises wear in the cylinders, and the Speedyelectric jet cleaner. This portable jet emits steam and detergent for removing dirt and grease, and is estimated to achieve results equivalent to the work of five men using hand methods.

Electric water heating equipment and photographs of large scale boiler plant are also displayed.

■

In the industrial section of stand C.408/309, on which the British Electrical Development Association and the Midlands Electricity Board are jointly exhibiting, are displayed an example of a plastic moulding machine, an electric baking oven, and a model of a cold strip rolling mill.

The commercial section exhibits include a glass-washing machine, a portable film projector unit, a tape recorder of speech, an electric typewriter, and a dough retarder.

A motor-driven fan blowing air over a heated element for use in grain driers, and models of an in-sack grain drier, a grass drier, and a hop drier, the original of which is an experimental plant that has been used in Herefordshire, comprise the exhibits in the agricultural section.

■

A new pistol type hot air gun, which may deliver air up to temperatures of 700° F., is among the exhibits on stand C.117 where Service Electric Co. are showing blowing and suction equipment, portable and stationary blowers, hot air blowers, electric chimney sweeping equipment, and marine, general purpose, and coded types of electric siren.

The latest modified version of the Secomak model 51 industrial vacuum cleaner is also on view; this has a large capacity, is easy to handle in confined spaces, and is mounted on pneumatic tyred wheels.

Secomak industrial vacuum cleaner. *Service Electric Co.*

Kez gun for cleaning condenser tubes. *Kleen-e-ze Brush Co.*

Industrial Brushware

A full range of brushware for all industrial purposes may be seen on stand D.143, where The Kleen-e-ze Brush Co. are exhibiting. Specialities include Keza tube cleaners and burnishers for clearing an unloaded pipe of any extraneous matter, and the Kez gun which discharges a bullet brush for cleaning condenser tubes, oil coolers, and similar apparatus, particularly when the deposits are of a sludge-like nature. Two other interesting exhibits are a brush-welt for draught exclusion and a flowbreaker which achieves optimum heat transference in all types of heat exchangers, and can also act as a filter, baffle, or mixer.

Industrial Plant

Galvanising by the hot process, food preparing machinery, specialised castings, and fabricated vessels for the food and allied industries in different irons and steels are some of the exhibits on stands D.719 and 1360 (outdoor section) which are designed to show the activities of the various companies of the Thos. W. Ward Group.

On the indoor stand, photographs of the groups' operations which cannot be exemplified by actual equipment, such as factory planning and installation work, industrial dismantling, and scrap handling, are exhibited. The display on the outdoor stand consists of examples of the range of machinery and industrial plant marketed by the parent company together with unit displays showing the activities and products of the subsidiary companies. Exhibits include sheet metal and wood working machinery, pumps and compressors, and various items of foundry plant.

■

Steel castings, small tools, permanent magnets, special tool steels, and axlebox liners can be seen on stand D.534, where Edgar Allen and Co. are exhibiting.

The steel foundry department's largest new exhibit is a 3 ton body in cast steel for a bolt forging machine, and the casting requirements of various industries are represented.

The contribution of the British Rema Manufacturing Co., a subsidiary company, to the stand comprises eight photographic illustrations dealing with the wide variety of crushing, grinding, air separating, mixing, and similar plants made as single units or for complete installations. With the exhibits is a selection of materials including minerals, chemicals, foods, and other substances shown in their raw state and also in stages of processing up to and including the fine powdered finished product.

Photographs of plants of various types, with illustrations of the machines made for them by the company, represent the engineering department.

Barrier Preparations

Advice on the best methods of combating dermatitis in particular industries is obtainable at stand D.706. Annual reports compiled by factory inspectors continue to show that this skin complaint still heads the list of those occupational diseases that are constantly undermining efficiency and leading to difficulties in the recruitment of labour for those industries where the risk of contracting dermatitis is greatest.

Rozalex are now in a position to provide barrier preparations against most of the known causative agents of dermatitis which, used in conjunction with proper medical supervision, have successfully reduced the incidence of the disease.

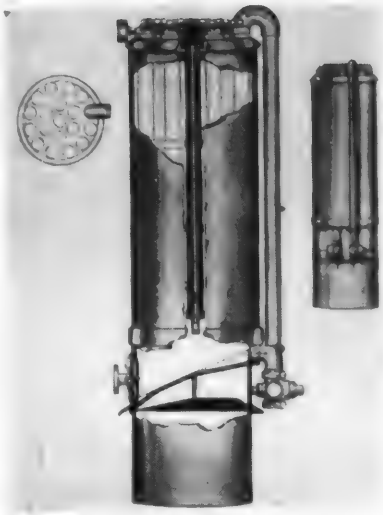
The Rex dispenser, a device developed by the company to ensure that the worker receives a controlled and uncontaminated supply of Rozalex whenever required, is also featured.

Power-driven Trucks

Power-driven trucks, recently added to the range of Wrigley motor trucks, on view on stand D.130 include a 3 h.p. hydraulic tipping truck, with steel body having detachable sides and hinged tail-board, designed to carry 15 to 20 cwt. loads. Another 3 h.p. truck, with hydraulically operated lifting platform, handles loads of about 10 cwt. from ground level to an elevation of 6 ft. The design of the main chassis, with open U-shaped frame, allows the lifting forks to drop to ground level, and the build of the frame permits the truck to enter under low stillages and benches.

A mobile crane for handling 10 cwt. loads which can be taken close up to the equipment to be lifted, and 1 and 3 h.p. hydraulic stillage trucks for handling stillages with a loading of 10 cwt. and 1 ton respectively are other exhibits of Wessex Industries (Poole).

Hydraulic tipping truck with detachable sides and hinged tail-board. *Wessex Industries (Poole).*



Multi-candle type of pressure filter. *Doulton and Co.*

Industrial Ceramics

A wide range of porous ceramic media for filtering, aerating, and electrolytic processes, made from a variety of acid-resisting ceramic materials, is being shown by Doulton and Co. on stand C.411/310. Among those units displayed are a stainless steel pressure filter unit, a similar unit with the container made in special resistance glass, a stainless steel multi-candle type of pressure filter, and an entirely new type of pressure filter comprising fifty-four porous candles. Electrical porcelain insulators are on view, and three towers —an absorption, a plate column, and a bubble tower—made of acid-proof industrial stoneware form the central feature of the exhibit.

Laboratory porcelain and analytical and medical filter candles are to be seen on the company's stand D.24 at Olympia.

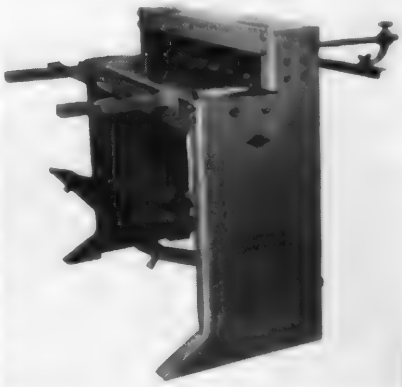
Metal and Wood Working Machines

Two models of Weybridge rotary gang slitting shears, a combined punching, shearing, cropping, and notching machine, hydraulic presses, and powder metals, including a new Sintrex metallurgical iron powder, a Monobloc compressor, petrol-vaporising oil engines, and various Metalclad wood working machinery, are among the exhibits of the 600 Group of companies on their stands 1832 (pavilion) and 1827/1226 (outdoor).

Included in the range of Jones KL cranes is a new 6 ton mobile crane, designed to meet the requirements of high speed for grabbing or operating with a magnet, and particularly useful for handling fragile merchandise or accurate placing of constructional units, exhibited by George Cohen Sons and Co., distributors in the U.K., in conjunction with the manufacturers and exporters, K and L Steelfounders and Engineers.

Six new machines, comprising an inclinable power press, a bar cropping machine, motor-driven and treadle-operated guillotine shearing machines, a circling shear, and a plate bending roll, are among the representative selection of tools and machinery shown by F. J. Edwards on stand D.411.

Also on view are a universal edging, bending, and folding machine, a swing beam folding, bending, and box forming machine, and a rotary combination swaging, flanging, wiring, crimping, joggling, strip and circle cutting machine, in addition to a selection of sheet metal working tools and machines. Standard ranges include lever shears, punches and bar benders, sheet metal workers' hand tools, flanging, wiring, and jenny machines, bench sheet and cone rollers, folding machines, and rotary type shears.



Treadle-operated guillotine. *F. J. Edwards.*

Technical Information

The Technical Information and Documents Unit, now part of the information services of the Department of Scientific and Industrial Research, is represented on stand W.2 at Earls Court and stand B.425 at Castle Bromwich, where full information can be obtained about the service provided.

Gas-fired Equipment

An essential feature of stand D.757/656 is an octagonal drying tunnel, 9 ft. long, incorporating eighteen Potterton gas-fired infrared panels, and fitted with a monorail conveyor with variable speed drive. Applications in the food industry for this equipment include high-speed drying of biscuit tin labels, pan-glazing, and drying of patty tins after washing.

Photographs on display show installations of tunnels of all shapes and sizes, and the activities of Thomas De La Rue and Co. in the field of hot water supply and central heating are represented by a display of four gas-fired boilers. Also shown is a range of Perfecta thermostats and control valves for all types of gas-fired equipment.

Another feature is a large-capacity cooker, which has a 10 in. high-efficiency grill and five full-sized boiling burners, three of which are fitted with a special simmering device. The extra large, temperature-controlled oven is fitted with a counterbalanced drop door suitable for resting dishes for basting. A model fitted with six boiling rings is also shown.

Mechanical Handling Equipment

The latest medium type MotaVeyor, in which sectional construction permits lengthening or shortening as required, is one of the main exhibits of J. Collis and Sons. The model can have a plain sheet steel top or gridded steel top for lighter loads where the nature of the load calls for a uniformly flat belt, a roller top for heavier loads, or a trough roller top for loose materials. Different belts can be fitted according to the commodity to be handled, and idler rollers carry the return side of the belt in all cases.

The SlatVeyor, the latest version of the slat conveyor, which is also shown on stand D.322/623, has all the advantages of the MotaVeyor in regard to flexibility and streamlined appearance, with steel or hardwood slats forming the carrying medium where the load and operating conditions are not suitable for the use of a belt. By fitting retaining strips on the slats, gradients can be introduced.

A wide range of RolaVeyors, and various models of the Collis truck and stacker, including the telescopic design of the latter, are also on view.

The MotaVeyor, showing enclosed driving cabinet and side frames. *J. Collis and Sons.*

Heat and Power Transmission

A representative range of their heat transmission equipment, including unit heaters to operate from steam, hot water or electricity, air heater batteries and coolers for air-conditioning installations and process work, Diesel engine coolers, and transformer oil cooler and refrigeration coils, are displayed on stand D.710 by The Spiral Tube and Components Company. The Spiraluxe wall mounting steam model, a miniature fan heater, with all-copper heating element suitable for steam pressure up to 150 lb. p.s.i., is on view; this is a development of the all-electric fan heater which incorporates automatic thermal cut-out, built-in switch, and attractive casing, and which is exhibited in two ratings.

Spiraluxe wall mounting steam heater.
The Spiral Tube and Components Co.

A feature of the stand is a model illustrating steam and fog removal from wash-houses and similar establishments, and there is also a complete heating installation comprising an oil-fired low-pressure boiler for the demonstration of types of equipment.

■

Completely new products and developments in the power transmission field are featured on stand D.406. The Taper-lock bush, shown for the first time in Great Britain, is a simple mechanism devised for holding pulleys to shafts. It mounts as a complete unit, and its use obviates the need for boring and keywaying stock rough bored pulleys. The design of the bush enables any pulley to be assembled or removed in a few minutes.

Taper-lock bush and pulley unit being screwed on to shaft.
J. H. Fenner and Co.

Two running exhibits demonstrate developments in the range of Hainsworth variable speed V-belt drives, in addition to which there are five stationary units with individual adjustable sole plates, together with new sizes in the variable speed V-belt. A giant V-belt drive with 16 D section Mark 5 V-belts, and Fenaplast plastic solid woven belting for power transmission and conveying are also shown by J. H. Fenner and Co., in addition to various types of belts, pulleys, hydraulic leathers, spindle tapes and webbings, and flexible couplings.

■

A wider range of power transmission equipment than it has been possible to show before is exhibited on stands D.343 and 238 by Crofts (Engineers). Apart from their general stock, they are featuring Ritespeed geared motors and reduction gears, the latest design in gear unit construction, and their patent B.O.M.-L clutch, which will prove of interest to machine tool makers.

Split taper bushed V-pulley.
Crofts (Engineers).

There is a special display of the company's latest development in V-rope driving—split taper bushed V-pulleys, and a representative showing of their heavy engineering transmission equipment, including working exhibits.

Lacquers for Food Cans

Specialists in the production of non-poisonous gold lacquers used for the interior protection of food cans, Arthur Holden and Sons are showing on stand B.402 their acid-resisting and sulphur-resisting gold lacquers—Super Zinnatine and Super Sulfatine. In addition to these, which form the major part of their production of lacquers used for fruit and vegetable cans, the company produce deep stamping lacquers for fish cans. They are also making synthetic lacquers for meat packs, and other types of synthetic lacquers which have notable properties of elasticity and resistance to acids and sulphur.

Laboratory model of D.P. series mixing machine.
Foster, Yates, and Thom.

Mixing Machines

The two most important exhibits on stand D.504 comprise models of the D.P. series mixing machines and a 50 ton fully automatic plastic moulding press.

The design of the mixing machines, manufactured by Foster, Yates, and Thom, ensures an accurate and consistent mix without regard to proportions, grain sizes, or specific gravities of the ingredients. They are supplied in sizes ranging from 10 lb. charging capacity up to 15 cwt. at sp.gr.1, and the mixing containers are made chiefly in stainless steel, aluminium, or mild steel.

The press is the company's latest addition to its Lancastrian series of hydraulic presses, and is used in the manufacture of thermo-setting compression type mouldings. It will mould up to six articles, having a total volume of 24 cu. in. at each pressing.

Vibrating Equipment

Among the petrol or electric driven vibrators and vibrating tables being shown by E. P. Allam and Co., who are exhibiting on stands 1215 and 1114 (outdoor section), are high frequency vibrating screens, fitted with external electric vibrators or variable amplitude mechanical vibrators, for use in granaries and other installations. A Diesel as well as an electric model of their hydraulic bar cropper are on view, and the Planet friction winches and platform hoists include a new mobile 7/10 cwt. type, incorporating the latest improvements. This has a standard mast of 22 ft., but provision is made to extend to any height provided the mast is tied into the scaffolding structure.

Plastic Products

The uses of I.C.I. plastics in the engineering industries are demonstrated on stand D.412 in the Plastics Division. Particular attention is being given to the use of nylon moulding powder for the moulding of small bearings, rings, and similar components where the toughness and self-lubricating properties of this plastic can be exploited. Polythene tubing for water service lines is shown and the technique of jointing and welding illustrated. Another feature is polythene film for protective packaging and polythene chemical plant made from granules or sheet material. Perspex acrylic sheet for machine guards, canopies, and screens, as well as corrugated Perspex roof lights, in clear and coloured grades, are on view, in addition to Diakon industrial mouldings, particularly electrical accessories.

OLYMPIA

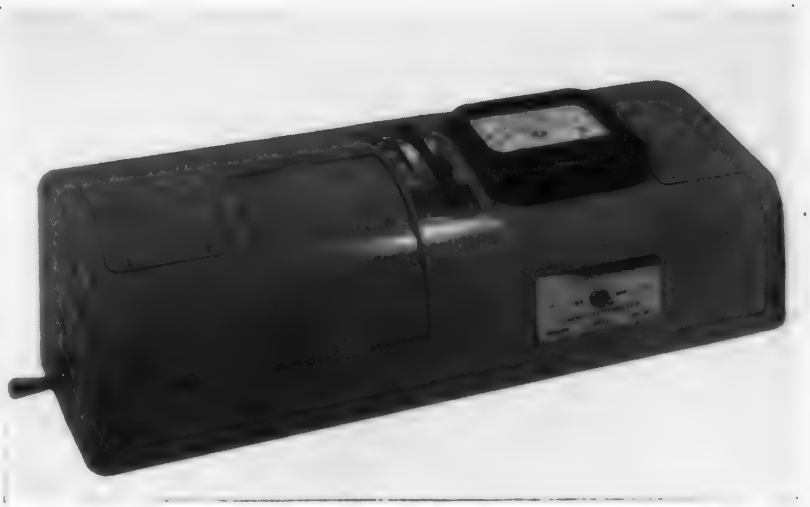
Colour Measurement

Their colour measuring instruments, the Lovibond Tintometer and the Schofield apparatus, are being featured by The Tintometer, Ltd., on stand D.55, and both instruments are being demonstrated so that customers can try out their own samples.

The new improved type Lovibond comparator is also on display, with an even wider range of the discs of glass colour standards covering a wide range of *p*H, chemical analysis, and other tests. The complete *p*H testing kit, covering the range from 3·0 to 11·0 in steps of 0·2, has been redesigned to incorporate the new type comparator, and is now housed in a polished mahogany bench case.

A selection of Ogal brand fused glass cells is also being displayed.

Lovibond Schofield apparatus.
The Tintometer, Ltd.



"EEL" absorptiometer. *Evans Electroselenium.*

Photo-electric Instruments

An interesting range of photo-electric instruments is exhibited on stand D.9 by Evans Electroselenium. A simple compact instrument enabling the ready determination of small traces of sodium and potassium in a solution, the EEL flame photometer is complete with galvanometer, gas and air pressure gauges, and automatic gas regulator. To meet the requirements of chemical analysis by colorimetric methods there is an absorptiometer, and a reflectance spectrophotometer shown enables the colour of a surface to be expressed in the form of a graph or in terms of three coefficients. Other exhibits include a colorimeter, a photometer, a densitometer, and a light-operated relay for industrial use which will operate a 500 W. circuit.

Packaging Aids

Gummed and coated papers, including non-curling gummed papers and Devonvale coated papers, as well as fancy and metal papers of interest to boxmakers are to be seen on stand M.67. Developments which have taken place in heat-sealing, pressure-sensitive papers, tacky labels, and other specialities are in evidence, and there is a full range of sealing machines designed to pack anything from the smallest parcel to the largest bale. The Lightning labeller for label moistening, self-adhesive sealing tapes, Samson adhesives, and all kinds of stationery are other exhibits of Samuel Jones and Co.

Box Stitching Machines

The range of box and carton wire stitching machines being shown by British Brehmer on stand F.27 includes the Superfast model for straight or cross stitching of rigid boxes. This is suitable for work thicknesses ranging from thin card up to ¼ in. and is supplied in anvil lengths of 20 in. or 30 in. The collapsible carton stitcher is made in three models for stitching the carton, bottom sealing, and top sealing, but only the bottom sealing machine is actually on view. These are designed for the users of one-piece containers in corrugated or leather board and operate with broad flat wire or round wire as required.

Scientific Apparatus

Shown for the first time on stand D.33 is the Nivoc polarimeter, an educational model which can also be used for practical measurements. The optical system employs polaroid discs in the polariser and analyser, and a condensing lens in the polarising system to ensure parallelism of the light passing down the solution tube. A 20 cm. solution tube, with air bubble trap, is fitted as standard, but 10 cm. tubes are also available.

The instrument, made by W. and J. George and Becker, measures 13½ in. in height and is 15 in. long overall.

Nivoc polarimeter.
W. and J. George and Becker.

Chemical Products

Chemicals, fuel oils, lubricating oil, bitumen, aviation products, and many other items embracing the whole range of Shell products are represented in a comprehensive exhibit on stand B.1. The main feature is a cinematographic representation of the action taking place in the catalyst chamber of a catalytic cracking unit used in the manufacture of high-quality gasoline.

Five large photographs of refinery and chemical plant form the background both to attractive displays with many models depicting the histories of acetone surface coatings, detergents, cocooning, and vapour phase inhibitors, and other petroleum products, and to a large circular case in which are shown hundreds of samples of the products marketed in Great Britain.

The extent of the company's activities is conveyed by a large map giving the geographical dispositions of oilfields, refineries and chemical plant, tanker routes and bunker stations, research stations, and marketing areas.

*

Examples of both laboratory scale and full plant scale equipment assembled from their interchangeable glass units are shown by Quickfit and Quartz.

Laboratory apparatus includes new items such as a spinning-band fractionating still, various chromatographic adsorption columns and assemblies, a climbing film evaporator, and latest types of Soxhlet extractor and stirring gear.

A vacuum still is displayed with 6 in. bore vapour pipe, a 100 litre electrically heated reaction vessel, and a production scale Soxhlet extractor.

An interesting exhibit is a scale model of the sulphuric acid absorption plant, and sections of an 18 in. bore column and a 200 litre flask are also on view on stand D.5.

The main exhibit on stand B.5/16 compares the direct exports of The Distillers Company Industrial Group's relatively simple products with its larger indirect exports, contained in the more complex manufactured products of its customers.

Each of the divisions of the Group is featured in smaller displays, including illustrations of a typical distillery showing the interrelation between industrial alcohol, methylated spirits, and carbon dioxide production; a panel devoted to antibiotics showing typical data supplied to the medical profession; and a section showing the organic chemicals interests of the Group, with typical examples in which Bisol plasticisers have been combined with the products of the two subsidiary plastics companies.

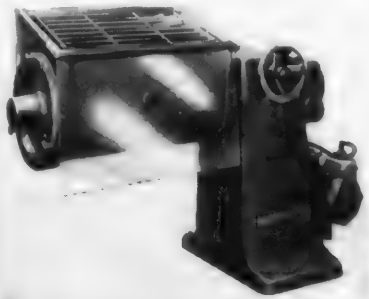
In the smaller of two lounges, the work of the D.C.L. yeast and malt extract department is shown, while a larger lounge and an enclosed office provide facilities for business transactions.

*

Special treatment is accorded on stand B.4 to a range of Aroclors, chlorinated diphenyls, which have wide applications in industry, including their use as plasticisers for lacquers, varnishes, and suchlike, as heat transfer media, and as plasticisers/extenders for various plastics. Diphenyl itself is used as an intermediate for organic syntheses and as a mould inhibitor for citrus fruit wraps. Also featured are Lustrex polystyrene, a versatile plastic material first manufactured in Great Britain by Monsanto Chemicals in mid-1950, weedkillers and insecticides, rubber accelerators, and a group of Silicon (Organic) Development products.

A comprehensive set of germicides and preservatives, including sodium benzoate and benzoic acid for certain foods and mineral waters, and representative products from the chemicals supplied to industry complete the display.

By means of monochrome photographs and coloured transparencies, the uses of May and Baker products in a wide range of activities are shown on stand B.25. In addition to developments in photographic products and a new developer for users of document-copying machines, the company have recently added Dicotox A, a selective weed-killer, to their range of horticultural products. Rhodoid brand cellulose acetate is once again available in a wide variety of coloured rods and sheets, and another recent introduction, Uvethon, is a transparent orange-coloured plastic film which provides an effective screen against ultra-violet and short wave-length visible rays. An interesting part of the exhibit is that devoted to the uses of the drugs evolved in the company's research laboratories.



H type mixer.
Manesty Machines.

Tablet Machines and Coating Pans

Several types of tablet compressing machines, including a rotary, a single stroke, and a bench model, are being shown by Manesty Machines. A mixer, designed for the intimate mixing of powders or moist masses, and especially suitable for tablet granulation, the Rotorgran oscillating granulator which is used with moist or dry material, several types of coating pans, and gas, electric, and steam-heated automatic water stills can also be seen on stand E.6.

Flavours and Essences

A display of the products they manufacture, including soluble and flavouring essences, essential oils, isolates, and fine chemicals, is being exhibited by W. J. Bush and Co.

As this is their centenary year, their stand, B.6/15, has been specially designed to mark the occasion. The exterior, which conforms to their standard pattern, represents 1951, and the interior furnishings and decorations typify the year 1851. The interior treatment is dominated by a mural, reproducing in colour the original painting by H. C. Selous which depicts the opening ceremony at the Great Crystal Palace Exhibition.

Aerial photograph of their works shown at Olympia by White, Tomkins, and Courage. A similar one is on view at Birmingham.

Erections and Extensions

Plans have been prepared for the extension of the factory of Burton's Gold Medal Biscuits at Vicarage Road, Blackpool.

*

A new factory, to be erected on a site at Fareham Road, Portsmouth, is planned by Smith's Potato Crisps (1929).

*

The erection of new premises at East Road, London, N.1, at an estimated cost of £15,000, is proposed by Sunmill Food Products.

Milk Products Trade Report

The preliminary Census of Production Report on the Milk Products Trade relates to establishments engaged wholly or mainly in the manufacture of butter, cheese, condensed milk, evaporated milk, dried milk, etc., including infant and invalid foods with a milk base, and in sterilising (pasteurising), cooling, and bottling milk, which employed more than ten persons on the average during the year. Milk bottling by retailers who do not maintain a central bottling or pasteurising depot is excluded.

The gross output tabulated in the Report for 1937 and 1935 excludes the output of establishments wholly or mainly engaged in the processing and distribution of whole milk in those years. It is estimated that 97 per cent. of the total net output of these establishments for 1948 is covered by the returns which have been compiled for inclusion.

This trade corresponds to minimum list heading 154(/1) in the Standard Industrial Classification. Establishments in the trade in Northern Ireland (excluded in the 1948 figures) accounted in 1937 and 1935 for less than 1 per cent. of the total net output for the United Kingdom.

Apart from the general summary, details of stocks of finished products, etc., materials, and fuel in 1948; plant, machinery, and vehicles; new buildings acquired; and employment, wages, and salaries, are included.

Scottish Egg Preserving Scheme

A considerable number of eggs from an Edinburgh packing station were oil-dipped and put into cold storage during the flush period of 1950; when these eggs were released during the winter, they were found to be in excellent condition, and the Ministry of Food are now extending the scheme.

The intention is to oil-dip and cold-store some 20,000 cases, each containing 30 dozen eggs, for release in the winter of 1951/2. Continued development of the scheme will depend upon oil-dipping facilities and storage space.

OBITER DICTA

- What an incentive and foundation to hard work lie in pork chops.—*Lord Hawke.*
- The suggestion that no food contains the same protein value in proportion to its cost, or gives such sustenance as meat, is sales talk.—*"The Vegetarian Messenger."*
- I have arranged for the distribution of frozen tripe to be in the hands of Associated Tripedressers, Ltd.; this is a Government agency. — *Mr. Maurice Webb, Minister of Food.*
- A sausage prepared with milk may appeal to you, but I personally dislike the idea of a creamy sausage. It suggests to me a sort of meat blancmange. —*Correspondent to the "Colchester Gazette."*
- He asked if anyone had seen a sugar conveyor, insinuated that the Government had let doctrinaire considerations influence its attitude to tomato sauce, and sat down.—*"Bebington News."*
- French families are simply not vitamin conscious. They eat food because it looks nice. They forget the dangers of too rich sauces and indigestible trimmings.—*Dr. Xavier Leclainche.*
- Cattle were provided with horns for defending their young and getting through thickets, and if there is anything a cow is not now called upon to do, it is to defend her young and scramble through thickets.—*Argument for dehorning put forward at a meeting of the Metheringham Agricultural Discussion Group.*
- Pilchard pasties! Did you ever hear anything like it? They put these silly, daft things in the papers, but these M.P.s —I don't think they are living on pilchard pasties, not to look at some of them.—*Criticism of M.O.F. recipes by Miss A. E. Moorhouse, of Leeds, at the Independent Traders' Conference at Buxton, Derbyshire.*
- The butcher has to be the shock absorber between an infuriated public and the Minister of Starvation. He has to be a zoologist, able to differentiate at a glance between beaver, whale, rabbit, and reindeer. He has to be a mathematician, able instantly to divide a 12 oz. can of corned beef into nine equal rations of 1⅓ oz. each. Finally, he must be a nuclear scientist able to split 8d. atoms from infissionable tissues of sinewy scrag.—*Major H. R. Spence, M.P.*

Booklets Received

Produced in support of the national scrap drive, the booklet *Scrap means Steel* endeavours to explain simply why scrap is needed to implement the steel production programme. Published by Thos. W. Ward, it is aimed primarily at those industries whose operations do not bring them into touch with the economics of steel production—industries which could materially help in the scrap drive if they became aware of the urgent necessity for increasing scrap returns.

*

A concise and elementary description of the photo-electric cell for the non-technical reader, its uses in industry, and its uses and shortcomings in colorimetry, is given in the booklet *Electric Eyes*, produced by The Tintometer, Ltd.

It is in the field of colorimetry that the functions and limitations of the cell are most misunderstood, and the booklet shows how lack of appreciation of the colour-blindness and shortcomings of the photo-electric cell can cause entirely wrong conclusions to be drawn from figures obtained by the use of photo-electric absorption meters.

*

Engaged in the manufacture of electrical instruments, naval control gear, and apparatus for distant indication and control for over fifty years, Evershed and Vignoles have recently issued a new general catalogue in which their earth and insulation testers, Bridge-Megger testing sets, ohmmeters, recorders, and other instruments are fully described and illustrated.

*

Motor-driven, Diesel-driven, and tandem steam engine driven compressors are described and illustrated in the latest publication of G. and J. Weir on this subject.

Anglo-German Patents

An agreement has been concluded between the British Government and the Government of the Federal Republic of Germany whereby the time for making belated applications for United Kingdom patents with priority, based on a corresponding application deposited in a filing office at Darmstadt or Berlin, may be extended until a date not later than May 31, 1951, provided the application so deposited continues to be dealt with by the Patent Office of the Federal Republic. Extensions have been granted by the Government of the Federal Republic for making applications in that country founded upon applications in the United Kingdom. The agreement is given effect by the Patents (Extension of Time) (Federal Republic of Germany) Rules, 1951.

World Food News

OVERSEAS ENQUIRIES

Various Foodstuffs

The United Kingdom Trade Commissioner at Kingston, Jamaica, has reported that Mr. J. F. Gore, Standard Works, Waterloo Road, Half-Way-Tree, Jamaica, desires to receive quotations from United Kingdom firms able to offer supplies of the following goods: skim milk powder; soluble powdered brewers' yeast (plain and flavoured); soya flour; iodised vegetable salt; wheat germ oil; milk sugar; and fruit juice extracts.

Firms interested in this enquiry should forward quotations direct to Mr. Gore at the address given.

■

The British Consulate General at San Francisco has reported that the Titus Pacific Corporation, 461, Market Street, San Francisco, 5, California, are desirous of representing United Kingdom manufacturers in the eleven Western States for food specialities, and particularly jams and marmalades; cheese; fish, including kippered herring, smoked eel, smoked mussels, and sardines; and ginger beer.

Firms who are interested in this enquiry should send quotations in dollars f.o.b. and c.i.f. San Francisco, together with information regarding deliveries and the gross and net weights of cases, direct to the Titus Pacific Corporation. The firm have also requested that samples and labels be submitted with offers.

■

Toffee-making Equipment

The British Consulate at Arequipa has advised that Señor Oscar Tapia R.V. of Calle Merced, 214 (Casilla 241), Arequipa, is interested in equipment for producing toffee. The apparatus should be capable of producing up to 1,500 lb. of toffee in eight hours and should operate on an alternating current supply, with a frequency of 50 cycles and a voltage of either 220 or 110.

Interested United Kingdom manufacturers are invited to send details of their equipment (including, where possible, prices, delivery dates, and any available literature) direct to Señor Oscar Tapia R.V. at the address given.

■

Fish-freezing Equipment

The United Kingdom Trade Commissioner for the Maritime Provinces and Newfoundland reports that the Hon. W. J. Keough, Minister of Fisheries and Co-operatives at St. John's, Newfoundland, wishes to obtain particulars of equipment for for the instantaneous freezing of fish.

Mr. Keough states that his interest in this equipment was aroused by the visit of a Danish firm's representative, who claimed that the unit offered by his company froze such items as blueberries instantaneously, and smaller-type fish (*e.g.* herring, mackerel, etc.) in about fifteen minutes. The Ministry has no projects involving fish-freezing plant on hand at the moment, but Mr. Keough would like to have details of suitable equipment available in his office for use against possible future enquiries.

Interested United Kingdom firms are invited to send full details of their equipment direct.

■

Refrigerated Markets and Slaughterhouses

The Counsellor (Commercial) to H.M. Embassy, Mexico City, reports that Cia. Constructora Panamericana S.A., Articulo 123, No. 37 6° piso, Mexico D.F., wish to obtain details of the kinds of refrigerated markets and slaughterhouses which can be offered by United Kingdom manufacturers.

The company state that they have been commissioned by the Government of the State of Jalisco to construct several model-type refrigerated markets of various sizes and an up-to-date slaughterhouse. They are confident that suitable installations are already operating in Great Britain, and would welcome particulars of, firstly, the system used in the United Kingdom for the refrigeration of different types of foodstuffs, distribution to wholesalers and retailers, access to the public, lighting by day and night, etc., and secondly, the essential requirements for a slaughterhouse having the best possible conditions as regards hygiene and cold storage of carcasses.

Interested United Kingdom firms are invited to send plans of specimen installations direct to Cia. Constructora Panamericana at the above address, together with quotations for suitable machinery, with delivery periods, terms of payment, and other data.

■

Miscellaneous Equipment

The United Kingdom Trade Commissioner at Trinidad has reported that J. N. Harriman and Co., Ltd., P.O. Box 232, Port of Spain, Trinidad, are desirous of acquiring hand trucks with rubber-tyred wheels for handling cooking stoves; hand trucks with rubber-tyred wheels for handling one propane gas cylinder; cooking oven portable pyrometers complete in carrying case; battery coffee brewers; conversion burners complete with 100 per cent safety shut-off valves; adjustable cable binders for firmly locating propane gas cylinders during transportation by truck; steam boilers; high temperature furnaces; and furnace conversion burners.

The articles of equipment in the list which require heat would be operated only by propane gas, and equipment operated by any other fuel will not be acceptable.

Interested United Kingdom manufacturers should send full particulars of their products, including descriptive literature, prices (if possible, c.i.f. Port of Spain), and delivery dates, direct to the company.

Further information can be obtained from the Special Register Information Service of the Board of Trade, Thames House North, Millbank, London, S.W.1.

New Fruit Spread

A new bread spread—a half-and-half mixture of fruit juices and honey—has been developed on a laboratory scale by the United States Department of Agriculture. Fruits used successfully include raspberries, grapes, loganberries, oranges, peaches, pineapples, and apricots.

The mixture is evaporated under vacuum at low heat in order to preserve the flavour, and is then cooled. Before packaging, a small amount of fine, crystallised honey is stirred in slowly to give the product a creamy texture.

The spread, which does not require refrigeration, may be used like a jam or a jelly.

Food Delegation in Australia

Following a conference with the Dried Fruits Export Control Board in Victoria, the British food delegation to Australia left Melbourne on March 22 to study first-hand methods and problems of Australian cattle stations.

Mr. F. T. Willey, Parliamentary Secretary to the Ministry of Food, told the House of Commons that the delegation intended to buy the whole of Australia's exportable surplus of beef, veal, mutton, and lamb without limits on quantity.

After their tour of Queensland, the British delegation went to Sydney; they are leaving for New Zealand on May 1.

Russians Develop New Type Tea

Tea specialists from all over the Soviet Union recently attended a conference at which they heard that tea had been grown in Russia where it had never been grown before. They were told that Moldavian experts are developing a method of growing the tree variety as well as the bush type of tea; they also learned that Dr. Xenia Pakhyadze had produced a new type of tea which gives a high yield and is resistant to cold.

S. Rhodesian Sugar Refinery

A new sugar refinery, set up by Rhodesia Sugar Refinery at Salisbury, Southern Rhodesia, is expected to help materially in overcoming the local sugar shortage.

Owing to a sharp increase in demand during the past year, the sugar refinery at Bulawayo, which has a normal capacity of 500 tons a week, has been unable to meet all demands, although it has recently been turning out an average of 700 tons weekly.

Dust-free Milling

A practically dust-free operation achieved by a pneumatic system for handling all ingredients, a vitamin spray introduced into the batch mixer and controlled from the laboratory, and remote control of all operations by means of push-button switches at the feed-in area, are some of the outstanding features of The Teske Milling Company's feed mill at Iowa.

Colour is used in the mill to indicate danger points and identify each of the return storage pipes for different ingredients. All interior construction is in structural steel, and outside walls are made of Cemestos board, a new building material 1½ in. thick, providing insulation claimed to be equivalent to that of a 1 ft. brick wall.

The Bang feed mill has an eight-hour capacity of 30 tons of feed and can operate without any batch weighing scale. Many ingredients for the 1 ton batches are used in multiples of 100 lb. units so that two men discharging sacks manually into the feed-in dump can keep up with production schedules. From the dump, materials are conveyed over a magnetic pulley to separate tramp iron, after which they pass through a feed finisher or small hammer mill. They then drop into the pneumatic tube and are blown 60 ft. up to a cyclone collector on the top floor. From there they drop to a 1 ton mixer and then to one of four sacking bins. These are all served by one scale, mounted on metal arms which pivot. A sewing machine is situated nearby for closing bags.

Packing is facilitated by an electric vibrator installed on each sacking bin which can shake loose any feed choked up near the discharge end. Efficient dust hoods remove dust created during packing operations and return it to the cyclone collector.

During the churning operation in the batch mixer, vitamins A and D are incorporated in the feeds. Molasses is also introduced into several of the twenty-two Bang formula feeds during mixing. One of the kilns left over from cement block operations is to be adapted by lining it with sheet steel so that it will hold 1½ tank trucks of molasses.

Mauritius Sugar Exports

According to reports from Mauritius, a contract has been concluded for the export of 25,000 long tons of molasses during the 1951 crop season. This figure is roughly one-quarter of the estimated output. Previously about 40,000 tons went to distilleries and the balance was either put back on the land or wasted.

Bulk terminal installations will be built in Port Louis and should be completed by about October of this year.

Marshall Aid Chief Visits "Naarden"

In order to ascertain the extent of Holland's achievement in the field of organic chemistry, Mr. Clarence E. Hunter, chief of the Marshall Administration in the Netherlands, visited the "Naarden" Chemical Works at Bussum. The visit included a tour of the various departments, including the underground rooms where fruit juices are stored in 450 gallon earthen holders. Following a dinner at Hilversum, arranged by the company, Mr. Hunter addressed the Dutch Society for Industry and Trade and gave members an outline of the present trend of events in the Marshall Aid programme.

Tender Meat Research

More tender meat is the object of research now getting under way at Iowa State College with the help of a grant-in-aid from Swift and Co., the meat-packing firm of Chicago. Research workers hope to determine the chemical and physical basis of tenderness in meats, as well as what bearing connective tissues and heating have upon this quality.

Australian Fruit Production

Australia's production of canned and dried fruits this season is likely to be lower than usual. Heavy rain in the Goulburn Valley area in Victoria, the source of about 65 per cent. of Australia's canned fruit production, has badly damaged peach and pear crops which were to be processed.

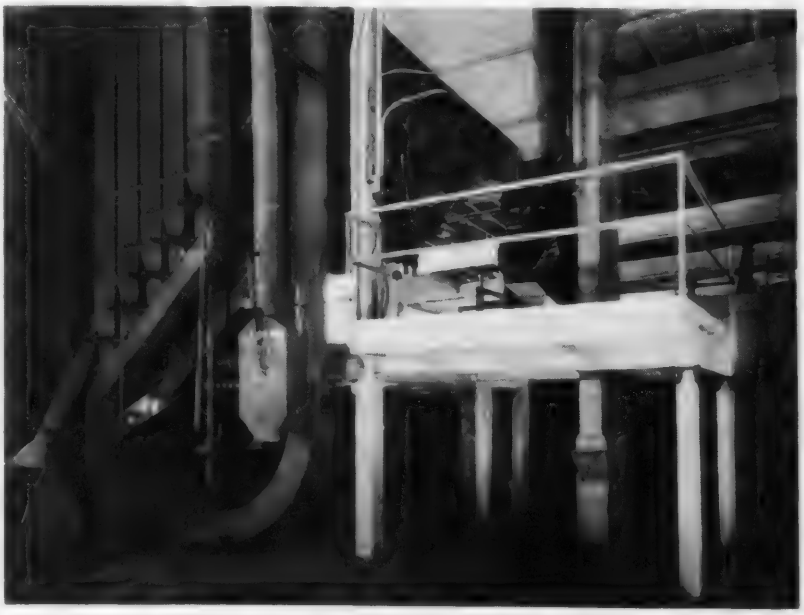
According to the secretary of the Australian Dried Fruits Association, latest reports on the dried fruit output from the Mildurn district of Victoria also indicated that production would be below the earlier estimate of 70,000 to 75,000 tons, this year's harvest showing a lower yield per acre than was the case during last year's bumper season.

Dutch Ham Presses

The high quality of Danish canned meat products is attributable not only to the fact that the best raw material is obtainable, but also to the skill of the workers and to the canners' equipment and machinery.

A great part of the machinery in the canneries is of Danish origin and designed especially to obtain products of the highest possible quality. In order to improve the quality of canned hams, a Danish firm, Conserves-Teknik, have designed several ham presses which operate either by compressed air or by hydraulic pressure. They are constructed so as to ensure that the ham produced is of the desired shape, and correct pressure and pressing time are always maintained. Output ranges from 2 to 3 hams per minute.

The presses are used mostly in Denmark but are also exported to Belgium, Holland, and Sweden.



Feed-in dump, conveyor-elevator, feed finisher, and air line on ground floor of the Bang feed mill.

News from the Ministries

Bread Subsidy for Scotland

Following discussions between the Ministry of Food and the Scottish bakers, the provisional rate of bread subsidy for Scotland has been reduced from 6s. per sack to 4s. as from February 18, 1951, coincident with the increase in the price of the pan loaf.

Sales of Dry Mixtures

A General Licence has been issued under the Dried Fruits Order, 1951, authorising, until further notice, the purchase and sale of imported dry mixtures of sugar, dried fruit, and suet or equivalent fat, with or without peel.

Sales of these dry mixtures are prohibited by the Dried Fruits Order, but the General Licence will enable traders to dispose of existing stocks and of any further supplies that remain to be imported under contracts. made before February 1.

Alteration of Flour Millers' Grists

Grists for breadmaking in England and Wales were altered on April 9, 1951, as follows:

	Per cent.
Home-grown wheat (minimum)	15
Manitoba wheat (maximum)	40
Australian and/or American white meat (maximum)	15
American wheat (other than white) and/or other imported wheats not specified above (maximum) ...	30

In Scotland a maximum of 60 per cent. Manitoba wheat is permitted in the springs grist. No alteration has been made in the grist of Northern Ireland.

There is no restriction in the use of Australian wheat in other blended grists.

Monopolies and Restrictive Practices

The second annual report by the Board of Trade on the working of the Monopolies and Restrictive Practices (Enquiry and Control) Act, 1948, has been published.

The main events of the year have been the publication of the Monopolies and Restrictive Practices Commission's first report, the two new references made to the Commission by the Board, and the decision of the President of the Board of Trade to increase the membership of the Commission from eight to the statutory maximum of ten.

Part I of the report deals in turn with (*a*) the basic information that should be recorded about the Commission's establishment and expenditure; (*b*) the progress made by the Commission with their programme of work during the year; and (*c*) the various steps taken by the Board in pursuance of the Act. Part II consists of the review, required under Section 16(2) of the Act, of the suggestions and requests made to the Board during the year for the reference of matters to the Commission.

Chocolate Prices

A further increase in the price of cocoa beans has necessitated the revision of maximum prices for chocolate and sugar confectionery and cocoa products.

Apart from the necessary amendments to give effect to the increased prices of chocolate couverture and to the extension of the scale of maximum prices of chocolate and chocolate confectionery, the principal changes in the new Chocolate, Sugar Confectionery, and Cocoa Products Order, which came into force on March 15, are:

1. The Cocoa and Chocolate (War Time) Association is empowered to classify chocolate, chocolate confectionery, and chocolate couverture, and the Sugar Confectionery (War Time) Association to classify sugar confectionery, without any further authority from the Minister; each Association is similarly empowered to alter or revoke classifications, to authorise extra charges for fancy boxes, and to approve "approved marks" for manufacturers and "approved names" for confectionery.
2. Provisions have been made relating to invoices and labelling when classified confectionery is delivered or sold by retail in combination with an article that is not confectionery.
3. Provision has been made for certificates of a public analyst or the Government Chemist to be receivable in evidence.

U.K./Pakistan Trade Agreement

A trade agreement between the United Kingdom and Pakistan which wholly replaces the India Trade Agreement of 1939 was signed recently in Karachi. The new agreement is designed to correct the inequality of advantages which existed under the 1939 Agreement after the establishment of Pakistan as an independent Sovereign State within the Commonwealth.

Pakistan exporters will now receive tariff preferences on tea, bones, skins, and oil-seed cake and meal, among other products, when imported into the United Kingdom; United Kingdom exporters will receive preferences on certain iron and steel products, chemicals, paints, and engineering products when imported into Pakistan.

The new agreement came into force immediately and has an initial validity of eighteen months. Either Government may give not less than six months' notice of termination at any time after the expiry of one year. Both Governments have agreed that, should there be a material alteration in the volume and pattern of the trade that enjoys preference, they will consult together.

Imported Canned Brisling

The Imported Canned Fish (Maximum Prices) Order, 1950, has been further amended as from March 18, 1951.

The effects of the new Order are to free Norwegian canned brisling from price control, and to reduce the maximum prices of other imported canned brisling as follows:

	From *Per Case of* 100/¼'s. *s.*	*d.*	*To* *Per Case of* 100/¼'s. *s.*	*d.*
On a sale by a first hand distributor to a wholesaler	82	5½	44	11½
On a sale to a retailer	86	5½	48	11½

As a result of good fishing last season, sardines are now plentiful and it has become unnecessary for the Ministry to continue to buy imported canned brisling. The price has been reduced in order to clear remaining stocks quickly.

Prices of Flour and Bread

The price of flour for all sales (other than by retail) by flour millers, licensed factors, and importers was increased by 5s. 9d. a sack of 280 lb. A consequential increase of the price of bread at the rate of ½d. a 1¾ lb. loaf took effect on April 8. These increases are a result of the higher cost of wheat.

As a result of increased costs, the extra charges allowed for bread that is completely wrapped and sealed in either waxed paper or cellulose film were increased on April 8 from 1d. to 1½d. for the 3½ lb. loaf, and from ½d. to ¾d. for the 1¾ lb. loaf. The extra charge of ½d. for the 14 oz. loaf remains unchanged.

The Flour Order, 1947, and the Bread Order, 1951, have been amended to give effect to these decisions. The provision in the main Order that unwrapped bread must be on sale at the same time as wrapped bread is unaltered.

Information and Advice

This Service is available for subscribers to FOOD MANUFACTURE. Postal replies will be sent if a stamped, addressed envelope is enclosed with enquiries.

Spiced Brine

B.5021. *We should be greatly obliged if you could let us have a recipe for spiced brines.* (Lancs.)

A spiced brine recommended for tongues requires the following ingredients:

Water ...	20 gal.	Juniper berries ...	4 oz.
Salt ...	40 lb.	Pimento	4 oz.
Saltpetre	1 lb.	Bruised coriander	4 oz.
Sugar ...	1 lb.		

Foot sugar is the best for the purpose, on account of its flavour. The saltpetre is dissolved in hot water and then added to the contents in the brine tank. The spices are boiled together in about 2 gal. of brine before they are poured into the bulk brine. If desired, 4 oz. of peppercorns can be included as well as the above spices.

A somewhat similar brine suitable for pork meats is:

Water ...	20 gal.	Bruised coriander	8 oz.
Salt ...	40 lb.	Pimento	4 oz.
Saltpetre	1 lb.	Bruised ginger ...	4 oz.
Sugar ...	2 lb.	Bruised cloves ...	2 oz.

Veal Galantine

B.5020. *Could you let us have a recipe for the manufacture of veal galantine.* (Ireland.)

The following recipe for veal galantine is given as a basis for experiment:

Veal	24 lb.
Lean boiled bacon	4 lb.
Cooked tongue	3 lb.
Fine rusk, dry	2 lb.
Anchovy paste	8 oz.

Seasoning.	*oz.*
Salt	9
Ground white pepper	3
Pistachio kernels	4
Truffles	4
Ground mace	½

Cooked pigs' tongues or the cuttings from ox tongues are suitable for use in this recipe. The rusks should be soaked in water, the pistachio kernels scalded and skinned, and the truffles chopped. The meat is boned carefully, removing all gristle, and then the veal, bacon, and tongue are put through one of the fine plates on the mincer. The mixture is put in the bowl chopper and the anchovy paste is added; this must be well distributed over the mixing. The seasoning and the rusk should then be added, and chopping continued until the mixture is very fine.

A galantine mould is lined with back fat at the bottom, sides, and ends, the fat for the bottom and sides being cut in one piece if possible. The cutting may be assisted materially by steeping the knife in hot water during the process. The mixing is packed into the mould, and care should be taken to leave no air-locks. The back fat is placed over the top and the lid fastened into position. If there be any slackness the lid must be packed and secured with string. The mixture is cooked for 1½ hours at 180° F., and allowed to cool before being turned out. It is then brushed over with glaze made with gelatin and cornflour.

Citrus Pectin Jellies

B.5027. *We should be glad to receive details of the manufacture of citrus pectin jellies.* (Warwicks.)

The following recipe is given as a basis for trial:

Best white sugar	50 lb.
Citrus pectin (100 grade)	3½ lb.
Corn Syrup (43° Baumé)	50 lb.
Water	50 lb.
Citric acid	3 oz.

The pectin is first mixed with 5 lb. of sugar in a dry container; this assists even distribution throughout the batch. The given volume of water is measured into a steam pan. The pectin-sugar mixture is added slowly and brought to the boil, stirring continuously. The corn syrup is added slowly while boiling, then the remaining 45 lb. of sugar gradually, stirring to dissolve sugar completely. The batch is cooked to 232° F. to secure a refractometer reading of 82·5 per cent. soluble solids, and to obtain a final yield of 111 lb. When somewhat cooler, the acid, dissolved in ½ pint of water, is added, and the batch flavoured and coloured, and mixed carefully without touching the sides of the pan. It is deposited in starch impressions and set aside in a warm dry place until the jellies have firmly set. The jellies are passed through the brushing machine, steaming chamber, and are then dry crystallised.

To ensure uniformity of product, flavouring and colouring should be strictly standardised, as there is very little margin between success and failure in the production of pectin jellies. For variations of the above standard formula, fruit pulp, ground fruit, or nuts may be added.

Rejected agar or pectin jellies or pieces may be chopped and used as a filling in fruit nougat, fudge, or coconut paste work.

Information Supplied

The Enquiry Service has dealt with requests for the names of manufacturers and suppliers of plant, machinery, and materials, and also general information as follows:

B.5019. *Potato crisps.* (Durham.)
B.5031. *Caviare and pâté de foie gras.* (Yorks.)
B.5032. *Sweetened and salted popcorn.* (Lincs.)
B.5034. *Salted nuts.* (Glos.)
B.5035. *Glass jars.* (Ceylon.)
B.5037. *Overalls and caps for factory use.* (Kent.)
B.5038. *Coffee roasting and grinding machinery.* (Ceylon.)
B.5039. *Dried beans.* (London.)
B.5040. *Skim milk powder, spray process.* (Scotland.)
B.5041. *Christmas puddings.* (Lancs.)
B.5042. *Small pressure cookers.* (Lancs.)
B.5043. *Sandwich spreads.* (London.)
B.5044. *Pliofilm bags.* (Yorks.)
B.5050. *Chicken fat.* (Bucks.)
B.5051. *Bacon and ham factory equipment.* (Jamaica.)
B.5054. *Synthetic sweetening materials.* (India.)
B.5056. *Insulation firebricks.* (Dorset.)
B.5058. *Fish cakes.* (Wales.)
B.5060. *Vibrating tables.* (South Africa.)
B.5062. *Plastic sample bags.* (Lancs.)

Information Required

B.5108. *Name and address of any firm who can dry liquid egg whites, making same into "dried egg whites."* (London.)

Recent Patents

649,077. NAAMLOOZE VENNOOTSCHAP W. A. SCHOLTEN'S AARDAPPELMEEL-FABRIEKEN, SOC. DES LABORATOIRES DE RECHERCHES POUR APPLICATIONS INDUSTRIELLES SOLAR, and JONES, L. E. (Naamlooze Vennootschap W. A. Scholten's Aardappelmeelfabrieken): Process of manufacturing starch products particularly suitable for being used as foodstuffs.

649,082. S.A.T.A.M. SOC. ANON. POUR TOUS APPAREILLAGES MÉCANIQUES: Fluid measuring and dispensing apparatus.

649,086. BUHLER BROS.: Method of and means for the cooling of mill cylinders particularly for grinding and flaking cereals.

649,111. STEVENS, A. H. (Liquid Carbonic Corporation): Beverage mixer.

Abstracts of Recent Specifications

Fish Dressing Machines

In some machines for dressing herring and the like the fish is affixed at the tail by a clamp carried by an endless band conveyor and is carried back upwards on the top horizontal run of the conveyor beneath dressing devices. These include a knife for cutting open the fish and a rotary tool for removing the gills. The gilling tool rotates in bearings carried on a vertical rod which can reciprocate vertically in a housing above the path of travel of the fish, and the rod is moved downwards by cam action against a spring to bring the tool into contact with the fish.

These machines suffer from the disadvantage that the gilling tool descends when each tail clamp has travelled through a fixed distance beyond it and accordingly will hit the gills only if the fish is of exactly the right length. If the fish is shorter than this the tool will never engage the gills at all and if the fish is longer the tool will strike the body of the fish and damage it before the gills arrive at the tool.

According to this invention a cam mechanism by which such a gilling tool is caused to reciprocate is controlled by a device which is displaced laterally by the fish at an early point in its travel and which moves back when the head end of the fish reaches or passes it. The moment at which the gilling tool engages the fish is determined by this movement..

In existing machines of this kind and particularly intended for preparing herring for kippering, the fish passes through a guide formed by two plates which are pressed against the sides of the fish by springs and which serve to present the fish centrally and back upwards to the slitting knife. Advantageously such a guide may be used as the controlling device to this invention.

If, as is usually the case, the head is still on the fish when it is fed to the machine, the two plates of the guide will move towards one another as they pass the eyes owing to the decrease in width of the skull of a fish at this point. This movement may be utilised as the controlling movement. Alternatively the further movement of the plates when the fish leaves them must be so utilised.

642,787. *Fisadco Limited and Percy Freeman.*

Mill Cylinders

This invention relates to a method of and means for the cooling of mill cylinders, particularly for grinding and flaking cereals, and consists in supplying a flow of cooling agent, *e.g.* water, at a constant rate adjusted to suit the operating conditions of the cylinders. Also supplying cooling agent at a rate which is regulated by the temperature of the cooling agent flowing out of the cooled grinding cylinders, there being a main passage for supplying a constant quantity of cooling agent and a secondary passage for supplying an additional flow of cooling agent as regulated by the temperature of the cooling agent flowing from the cooled cylinders. A manually adjusted valve is interposed in the main passage, a thermostatic arrangement being provided comprising a tubular element containing a thermosensitive fluid and immersed in the out-flowing cooling agent, and a valve proper being operatively connected directly with the thermostat and inserted in the secondary passage.

649,086. *Buhler Brothers.*

Recent patents have been selected from the "Official Journal of Patents" and are published by permission of the Controller of H.M.S.O.

Trade Marks

MN.—681,368. Fresh carrots and fresh melons. **Comité d'Exportation de la Fédération des Groupements Maraîchers Nantais** (a French Federation and a *Société en nom collectif* organised under the laws of France), 6, Rue Fouré, Nantes, France; Producers and Merchants.

CON-I-SUR.—683,011. Canned meats. **International Products Corporation** (a Corporation organised under the laws of the State of Delaware, United States of America), 29, Broadway, New York, 6, State of New York, United States of America, and San Antonio, Paraguay; Manufacturers.

MACLAR. — 686,124. Bread, pastry, flour confectionery, biscuits (other than biscuits for animals), and non-medicated confectionery. **David Maclaren (Caterers), Limited,** 1/5, Queen Margaret Road, Glasgow, N.W.; Manufacturers.

BONOMOLD-O.—689,592. Preservatives, being chemical substances for use in industry, for food, cosmetics, hides and skins, leather, and for textile fabrics, and chemical substances for precipitating salts dissolved in water. **Aktiebolaget Bofors** (a Joint Stock Company organised under the laws of Sweden), Bofors, Sweden; Manufacturers.

ESKIMO.—689,835. Ice cream (other than ice cream coated or flavoured with chocolate) and ice cream powder. **Eskimo Ices (Cardiff), Limited,** 23, Churchill Way, Cardiff; Manufacturers.

SOLMARZ.—690,039. Fillings and coating, all principally of marzipan, for use in the bakery and confectionery trades. **British Fondants, Limited,** Avern Works, Avern Road, East Molesey, Surrey; Manufacturers and Merchants.

DECOCREMM. — 692,174. Artificial cream (for food). **L. E. Pritchitt and Company, Limited,** 262, Uxbridge Road, Hatch End, Middlesex; Manufacturers and Merchants.

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New Companies

Head and Sons (Welling), Limited. (490386.) 18, Maddox Street, W.1. To carry on business of importers and exporters of fresh fruit and vegetables, fruiterers, etc. Nom. cap.: £10,000 in £1 shares. Dirs.: J. Edelman and Mrs. D. Edelman, 44, Kingsley Way, N.2.

L. and W. Packing Company, Limited. (490506.) 16/8, Colombo Street, Blackfriars, S.E.1. To carry on business of manufacturers of and dealers in boxes, cages, bins, tubes, crates, packing cases, etc. Nom. cap.: £3,000 in £1 shares. Dirs.: A. R. A. Lewis, 21, Eldertree Way, Mitcham, Surrey; R. Warren, 220, Bellingham Road, Catford, S.E.6.

W. A. Payne and Company, Limited. (490554.) 137, Lewes Road, Brighton. To carry on business of manufacturers of and dealers in confectionery, chocolates, sweets, ices, etc. Nom. cap.: £3,000 in £1 shares. Dirs.: Mrs. L. L. L. Homewood, 137, Lewes Road, Brighton; A. E. Payne, 4, Hollingdean Road, Brighton.

Gee Box Company, Limited. (490572.) 338, Rectory Road, Gateshead, Co. Durham. To take over business of cardboard box manufacturers carried on as "The Gee Box Company" at Gateshead, Co. Durham. Nom. cap.: £3,000 in £1 shares. Dirs.: L. Gee, 338, Rectory Road, Gateshead (permt.); J. Guttentag, 8, Cambridge Terrace, Gateshead (permt.); L. Cohen, 28, Liddell Terrace, Gateshead.

John Vallely and Sons, Limited. (490578.) To take over business of egg graders, packers, and general produce merchants carried on as "John Vallely and Sons," at West Tower Street, Carlisle. Nom. cap.: £7,500 in £1 shares. Permt. dirs.: W. Vallely, 48, Tullie Street, Carlisle; J. Vallely, 25, River Street, Carlisle.

Leslie Thompson, Limited. (490619.) 21, Glebe Road, Forest Hall, Northumberland. To carry on business of bakers, pastrycooks, flour millers, etc. Nom. cap.: £1,000 in £1 shares. Permt. dirs.: A. F. Holmes, Cocquet Villa, 246, Heaton Road, Newcastle-on-Tyne; L. Thompson, 24, Briar Edge, Forest Hall, Newcastle-on-Tyne (mang. dir.).

Peterstone Pedigree Herds, Limited. (490623.) 8, Ship Street, Brighton. To take over business of pedigree pig and cattle breeders, carried on as "Peterstone Pedigree Herds," at Sliders Farm, Furner's Green, Danehill, Sussex. Nom. cap.: £100 in £1 shares. Dirs.: Countess Stella Szechenyi, Sliders Farm, Furner's Green, Danehill, Sussex; R. C. Pascoe, 42, Hove Park Road, Hove, Sussex.

Underwood (Blaydon), Limited. (491813.) 91, Thomas Terrace, Blaydon, Co. Durham. To carry on business of bakers, pastrycooks, biscuit makers, confectioners, etc. Nom. cap.: £5,000 in £1 shares. Dirs.: S. F. Dickinson and Mrs. G. E. Dickinson, The Mount, Beech Hill, Hexham; R. Davies and Mrs. M. V. Davies, 93, Thomas Terrace, Blaydon.

Frozen Confections, Limited. (491830.) Warwick Road, Hampton Wick, Kingston-on-Thames, Surrey. Nom. cap.: £25,000 in 100,000 ordinary shares of 4s. and 10,000 cum. red. preference shares of 10s. each. Permt. dirs.: T. T. C. Garratt and Mrs. P. M. Garratt, Long Meadow, Clare Hill, Esher, Surrey.

Taken from the Daily Register, compiled by Jordan and Sons, Limited, Company Registration Agents, 116, Chancery Lane, London, W.C.2.